The RUBBER AGE

April, 1945

TECHNOLOGY DEPT.

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THE
ETHYL ACCELERATORS
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also
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R. T. VANDERBILT CO., INC.
230 Park Avenue, New York 17, N. Y.

R v. 57 Apr. - Sept. 1945

Newsletter No. 4
APRIL, 1945

Published by Rubber Chemicals Division of DU PONT

PROMPT USE OF NEOPRENE WILL AID PROCESSING

NEOPRENE processes best when reasonably fresh, but as it ages it becomes more plastic. Its rate of cure increases and it develops stickiness during processing. These changes are intensified during warm weather when the temperature of storage is elevated. Hence, it is important to use reasonably fresh neoprene.

Production of neoprene at Louisville, Kentucky, and at Carney's Point, New Jersey, is now controlled and adjusted to the existing demand and allows only for sufficient inventory to facilitate prompt shipment of orders. Rubber manufacturers can take advantage of this situation and will find that many processing difficulties can be avoided by adjusting purchases so that the amounts of inventory carried at their manufacturing points do not exceed a three weeks' working supply. This procedure will be especially important during the summer months.

Both GR-M and GR-M-10 are produced at Louisville, Kentucky. GR-M-10 contains 1% of an antioxidant stabilizer (not present in GR-M) and, although it softens with age almost as much as GR-M, it does not develop nearly so much undesirable stickiness. For many applications, especially in calendering and extruding, GR-M-10 is preferred to GR-M because of its better processing. Because it contains an antioxidant, it darkens on exposure to light. GR-M-10 is recommended for any use except in white and light-colored stocks or in contact with goods which are sensitive to staining by the presence of an antioxidant. If you are not using GR-M-10, investigate it now and plan to use it this summer.

To maintain good processing neoprene stocks:

1. Order only as much neoprene as you will use.
2. Carry a minimum inventory.
3. Use oldest lots first.
4. Use GR-M-10 especially for difficult processing jobs, except if white or light-colored.

NEOPRENE GR-M AND GR-M-10 are supplied by Rubber Reserve Company, Louisville, Kentucky. Purchase permits from Rubber Reserve Company, Washington, D. C., are required.

NEOPRENE TYPES E, M, CG, FR, KNR, and Latex are supplied by Rubber Chemicals Division of E. I. du Pont de Nemours & Company (Inc.), Wilmington 98, Delaware. For these, orders certified under Rubber Order R-1 are required. No purchase permits are needed.

BACK THE ATTACK WITH WAR BONDS

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. April, 1945, Vol. 57, No. 1.

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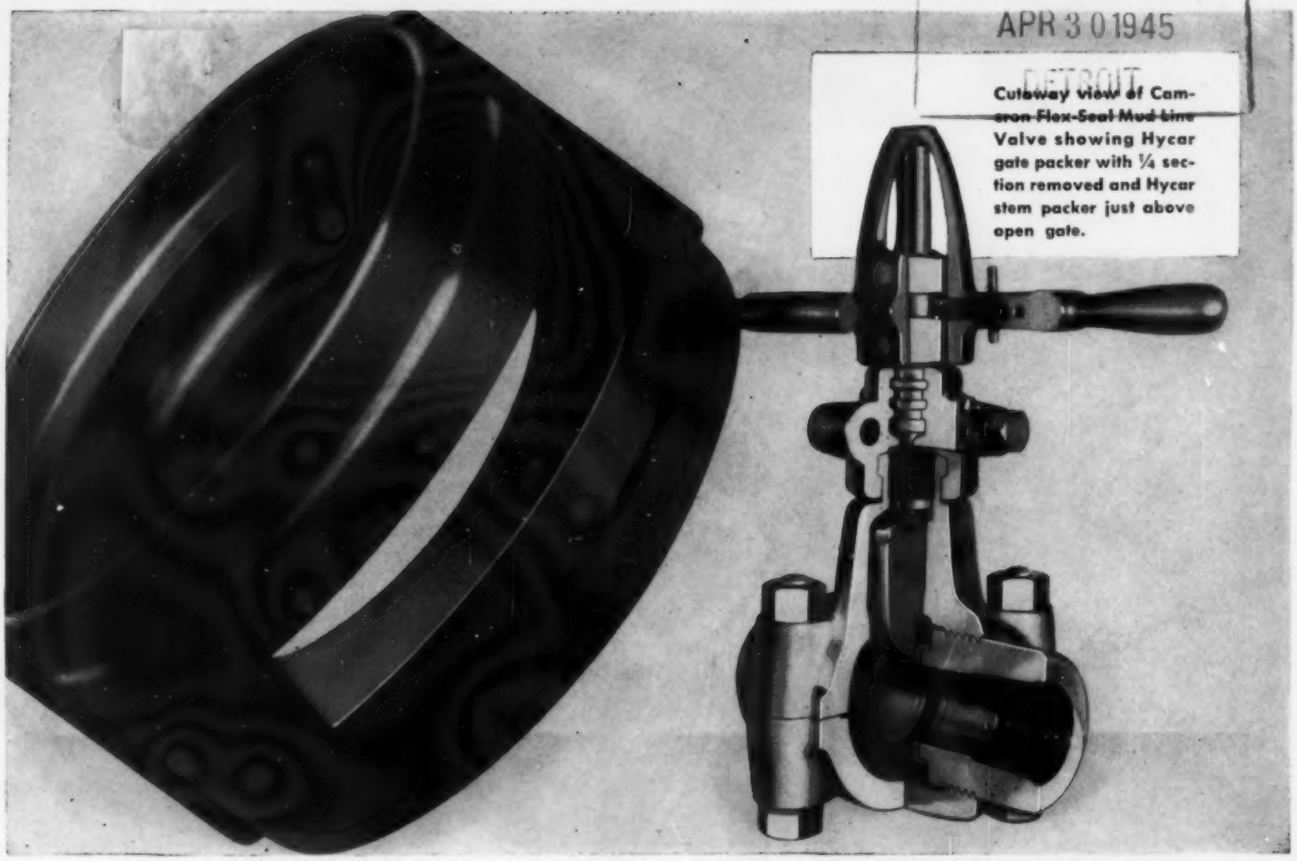


Cutaway view of Cameron Flex-Seal Mud Line Valve showing Hycar gate packer with ¼ section removed and Hycar stem packer just above open gate.

Closeup of Hycar Gate Packer.

Photographs courtesy Cameron Iron Works, Houston, Texas.

SATISFY TOUGH CUSTOMERS — USE HYCAR FOR TOUGH JOBS

OIL well drilling mud, moving at high velocity, quickly cuts the metal-to-metal seal usually found in conventional mud line valves. When this damage occurs, the ordinary valve must be removed and sent to a shop for repairs, requiring extra time and expense.

Engineers of the Cameron Iron Works, makers of the valves, solved this problem perfectly by using a gate packer made of Hycar synthetic rubber. Exhaustive tests proved that it was by far the best material available for this grueling service. Of course, Hycar is also used for the stem packer.

This is just one example of how men in the rubber industry are taking advantage of Hycar's unique properties to solve tough problems and satisfy exacting customers. Many of your present or potential customers have seen an abundance of evidence that products made from Hycar consistently outperform other synthetic rubber parts in a wide variety of services. They like Hycar and will ask for it—now and in the future. Capitalize on this increasing acceptance for Hycar in industrial rubber products—make Hycar the standard special-purpose rubber in your plant.

Hycar's technical service staff will be glad to cooperate with you on every phase of your synthetic rubber work — compounding matters or processing methods—new ideas or old applications—tough problems or routine production. *Hycar Chemical Company, Akron 8, Ohio.*

Our new booklet, "Everywhere in Industry" is being distributed to engineers, designers, and manufacturers in many different fields. We will be glad to furnish a copy for each member of your sales force—it will help them make better sales that will insure satisfied customers. Just let us know how many you need.

Hycar

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubbers

PHILBLACK A...NO extra PASSES!

A fast-working smoothie! Even with short mixing cycles, Philblack A stocks tube smoothly, splice well, and give that rubbery feel so difficult to obtain with other blacks. This ability to *rapidly* remove the nerve of synthetic rubber stocks is one of the reasons why Philblack A is so desirable for excellent mold flow, frictioning and calendering.

As the result of many successful road tests with a number of fleets, Philblack A is being widely used in the manufacture of tires: for carcass, side wall, and tread... because Philblack A combines high reinforcement and low hysteresis with excellent abrasion.

And now, of greatest interest is the outstanding feature that Philblack A imparts these desired properties with minimum loadings.

PHILLIPS PETROLEUM COMPANY
Philblack Division
First Central Tower • Akron, Ohio

. . . Show versatility of new polyvinyl materials

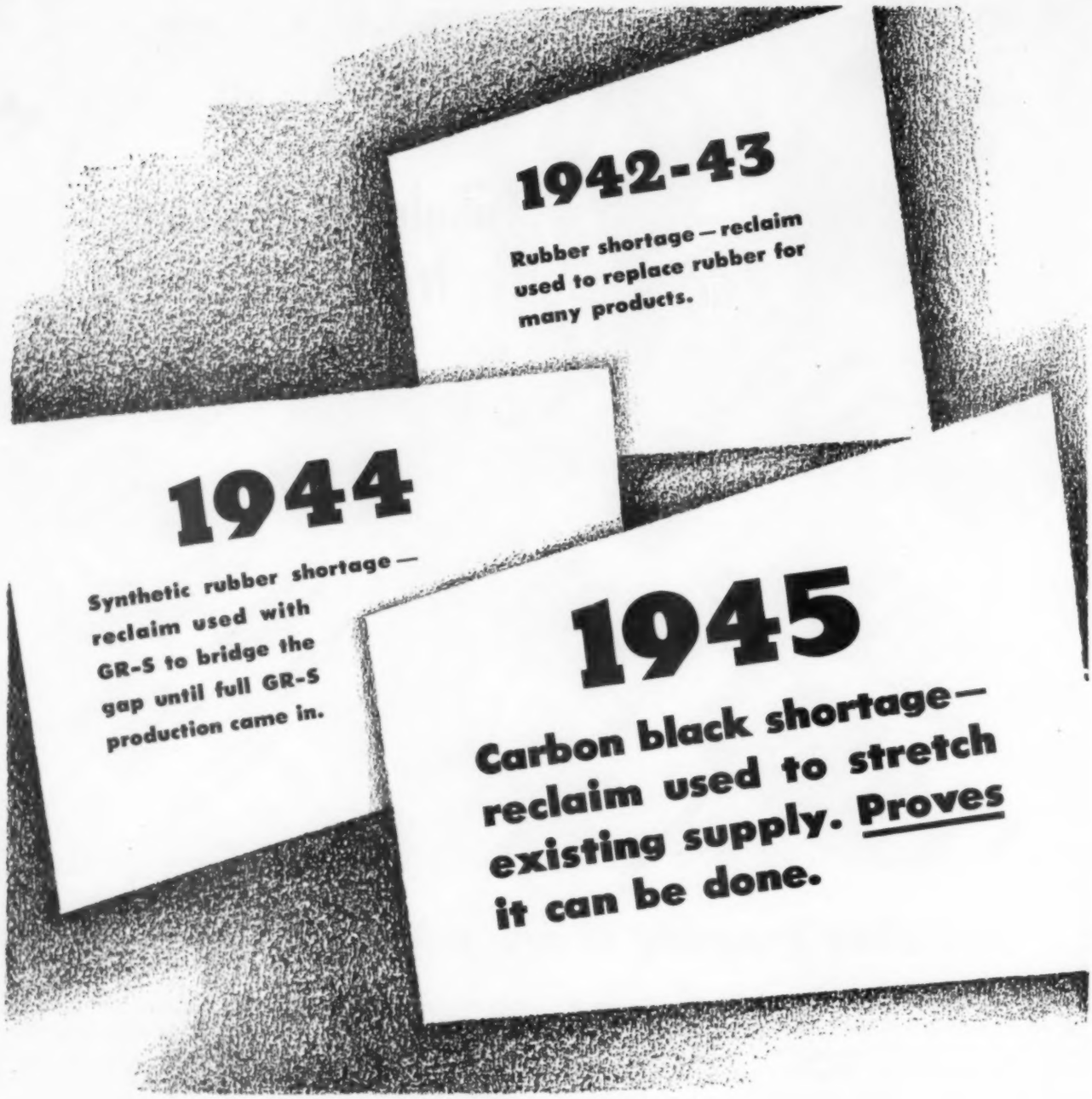
THOSE tubular sections represent a score or more of applications for GEON polyvinyl materials. There's "spaghetti", 10/1000" inside diameter, for slipping on radio and switchboard wire. It's brightly colored for quick identification. There's tasteless, non-toxic beverage tubing for bringing beer from the basement to the bar. There's hose that resists the action of acids under high pressure. And many, many others. Some are flexible—others rigid. Some are black—others brilliantly colored. All were processed on standard machinery.

The same variety may be found in cast or calendered unsupported sheet or film of GEON. Or in pressure or injection molded goods. Or in coatings for fabric or paper. The same properties—and many more—may also be found in these other forms in an almost limitless variety of combinations. What properties do you need in *your* product? Resistance to oils, chemicals, food, sunlight, air, wear, aging, flame, heat, cold? Do you need a flexible or rigid material? Should it be colored, clear or opaque? GEON offers these and many other important properties in combinations that can be *planned* to meet your specific requirements.

Urgently needed for military uses, all the GEONS are subject to allocation by the War Production Board. Limited quantities are available for experiment, and our development staff and laboratory facilities will help you work out special problems or applications. For more complete information write Department KK-4, Chemical Division, The B. F. Goodrich Company, 324 Rose Building, Cleveland 15, Ohio.

Geon
Polyvinyl Materials

CHEMICAL DIVISION
The B. F. Goodrich Company
324 ROSE BUILDING • CLEVELAND 15, OHIO


1942-43
Rubber shortage—reclaim used to replace rubber for many products.
1944
Synthetic rubber shortage—reclaim used with GR-S to bridge the gap until full GR-S production came in.
1945
Carbon black shortage—reclaim used to stretch existing supply. Proves it can be done.

THAT'S the wartime record—so far—of reclaimed rubber—a record that no other rubber-like material could equal. It's a demonstration of the versatility demanded of reclaimed rubber and the reclaimed rubber industry.

And nowhere in this important industry is there a company better qualified than Philadelphia Rubber to make sure that this material performs every job which it is called upon to do.

Take GR-S, for example. Philadelphia Rubber's accelerated research with GR-S established new and important facts about the compounding of GR-S and reclaim. Philadelphia Rubber research determined the compatibility of reclaim and GR-S, and went on to uncover ways of making better compounds at lower costs. This is research of the most practical kind because it will help now in winning the war.

This practical research is ready to work for you. Please accept our invitation to make use of our laboratory staff and facilities in solving any reclaimed rubber problem you may have now or in the future. Philadelphia Rubber Works Company, 324 Rose Building, Cleveland 15, Ohio.

PHILADELPHIA
RECLAIMED RUBBER

Yes . . .

THERE IS A NAME FOR IT

That name is

MULTI-PLAST

IT IS MADE by the originators and leaders in the field of sulfur-reactive plasticizers.

IT IS MADE especially for *you* as a primary product — *not* as a by-product.

IT IS MADE by large-scale production methods that bring it into the low-priced field.

IT IS MADE under rigid supervision to insure uniformly high quality.

MULTI-PLAST is brought to you by our technical representatives, experienced men with a know-how in rubber compounding. They can give you helpful suggestions on the use of MULTI-PLAST for low-cost high-quality compounding.

WILCHEM PRODUCTS: NAFTOLEN • MULTI-PLAST • ECONO-PLAST • NAFTEX
NAFTOLEN EMULSION • WILMEX • WILCOR RECLAIMING OILS • POLY-TINT

The booklet, "TENSILE STRENGTH TABLE", designed as an aid in your physical testing laboratory is available. Write for your copy.

WILMINGTON

CHEMICAL CORPORATION

10 EAST 40TH STREET • NEW YORK 16, N. Y.

Inspecting a liner before processing

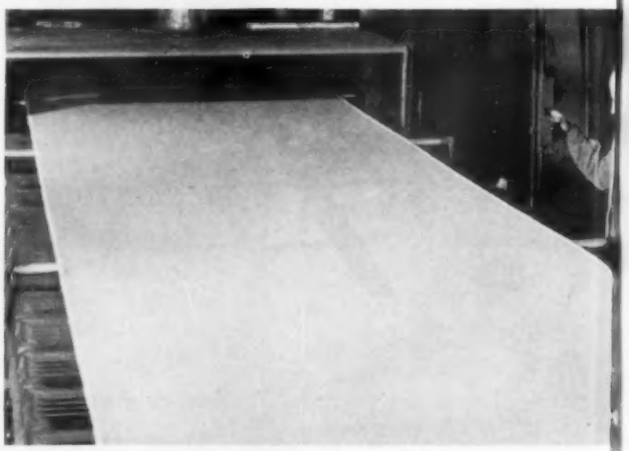
Compounding the processing solution

Applying solution to the fabric

CLIMCO
Craftsmanship

Experience and skill feature every step shown here, as your liner goes through our plant for Climco Processing. Many of our employees have been with us for years, and have gained invaluable "know-how" about our processing methods.

Leading rubber companies *prefer* Climco Processing because they have found it rapidly repays its cost by speeding production, plus saving man-hours and money. And many of these firms have *standardized* on Climco Liners because of their unvarying high quality that results from the craftsmanship used in our processing.



Drying the coated liner

Controlling the sheet to eliminate wrinkles

THE CLEVELAND LINER & MANUFACTURING CO.
5508 Maurice Avenue • Cleveland 4, Ohio

NEW Booklet

tells how to get better service from your liners. Illustrated with diagrams. Tells how to use liners more efficiently. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains NO OIL OR WAX
Samples on Request

CLIMCO PROCESSED LINERS
for Faster, Better Production at Lower Cost

We Guarantee A TRUE ROLL And We Do Mean TRUE!

COMBINING BACKING

We'll put the two selvages squarely together, eliminate any person now trying to pull selvages together by hand, and give you combined fabric upon which the user can lay his pattern right to the selvage edge, instead of an inch or so inside.

Guaranteed!

COATING, SPREADING OR DOUBLING

We'll guide the fabric right up to the wings of spreading knife, which will eliminate gettng compound on the roller, stops to clean roller, and solvents to wash roller.

Guaranteed!

SLITTERS

We'll hold trim within limits of 1/16" plus or minus on any material, effecting real savings on ends now thrown away as waste.

Guaranteed!

LET'S put it this way: we guarantee to hold your trim or weave to 1/16" plus or minus. That's what we mean by a true roll.

Compare this performance with the performance of your present guiding equipment, do a bit of scratch-pad figuring, and you'll see why more Stanford guides were sold last year than all other makes put together.

We will install one of our guides in your plant without cost or obligation, so that you can see for yourself what it will do under *your* operating conditions, handling *your* kind of material. That's the way we sell the Stanford Automatic Web Guide.

You may invite us immediately to make such a trial installation or, if you prefer, write for detailed literature.

Stanford AUTOMATIC WEB GUIDE

STANFORD ENGINEERING CO.

SALEM, ILLINOIS

A Timely Reminder!

Pelletex and Gastex

The Leading Semi-Reinforcing Blacks (Furnace Type)
for Natural and Synthetic Rubber Compounds

Easy Processing
Low Heat Build-up
Superior Aging
Low Permanent Set
High Resistance to Oil, Acids, Alkalis, Solvents and Steam

SUBSTANTIAL plant additions increasing the capacity of PELLETEX production by 20,000,000 pounds annually, will enable us to serve your post-war needs more promptly. Bear in mind that GASTEX and PELLETEX are produced in two States on different railroads, and served by separate gas fields.

HERRON BROS. & MEYER

OHIO BLDG., AKRON, OHIO.

GENERAL SALES AGENTS FOR

GASTEX TRADE MARK

PELLETEX TRADE MARK

GENERAL ATLAS CARBON

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ST. LAWRENCE CHEMICAL CO., LTD., Toronto - Montreal

Which of these important properties

DO YOU WANT IN A SYNTHETIC RUBBER?

WANT a rubber that doesn't swell or soften in oils and fuels — one that's ideal for gaskets, sleeves, packings, diaphragms, and other oil-immersed parts? There's a Butaprene-N rubber for the job! Want one that is flexible even at minus 70° Fahrenheit? One that performs at a blistering 300°? Then look into Butaprene-N! You'll find these new Butaprene Synthetic Rubbers by Firestone remarkably versatile. They're more resistant to abrasion than natural rubber, have high tensile strength, good elongation, low compression set.

Why not find out what these remarkable new Firestone synthetics will do for you? For complete three-color chart on physical properties of Butaprene-N Synthetic Rubbers write XYLOS RUBBER COMPANY, Akron 1, Ohio.

THE SYNTHETIC RUBBER OF A THOUSAND POSTWAR USES

Butaprene N *by* Firestone

Copyright, 1945, The Firestone Tire & Rubber Co.

TO HELP CURE THE JAP
WE MUST USE CURED SCRAP

$1,000. FOR THE BEST PAPERS ON THE UTILIZATION OF SYNTHETIC RUBBER SCRAP

The Jap thought he had crippled American Industry when he cut off our main sources of supply of natural rubber. He didn't. America now has its own rubber supply, thanks to synthetic rubber development on an unprecedented scale. However, the Jap left us with one unsolved problem: The utilization of synthetic rubber scrap. If you enter this contest and tell us how *you* think this scrap rubber can best be utilized, you may win up to $500.

Facts About This Big Contest

A group of rubber technologists identified with the rubber industry, known as the Chicago Rubber Group, is offering three prizes, totaling $1000.00 for the best papers on the utilization (reclaiming and processing) of cured synthetic rubber scrap. While the papers may deal with any phase of the problem, here are some subjects which suggest themselves: 1. Separation and segregation of synthetic scrap rubber. 2. Methods of identification of synthetic scrap rubber. 3. Reclaiming of synthetic scrap rubber. 4. Compounding studies which will result in greater use of reclaimed synthetic scrap, or of ground synthetic scrap rubber.

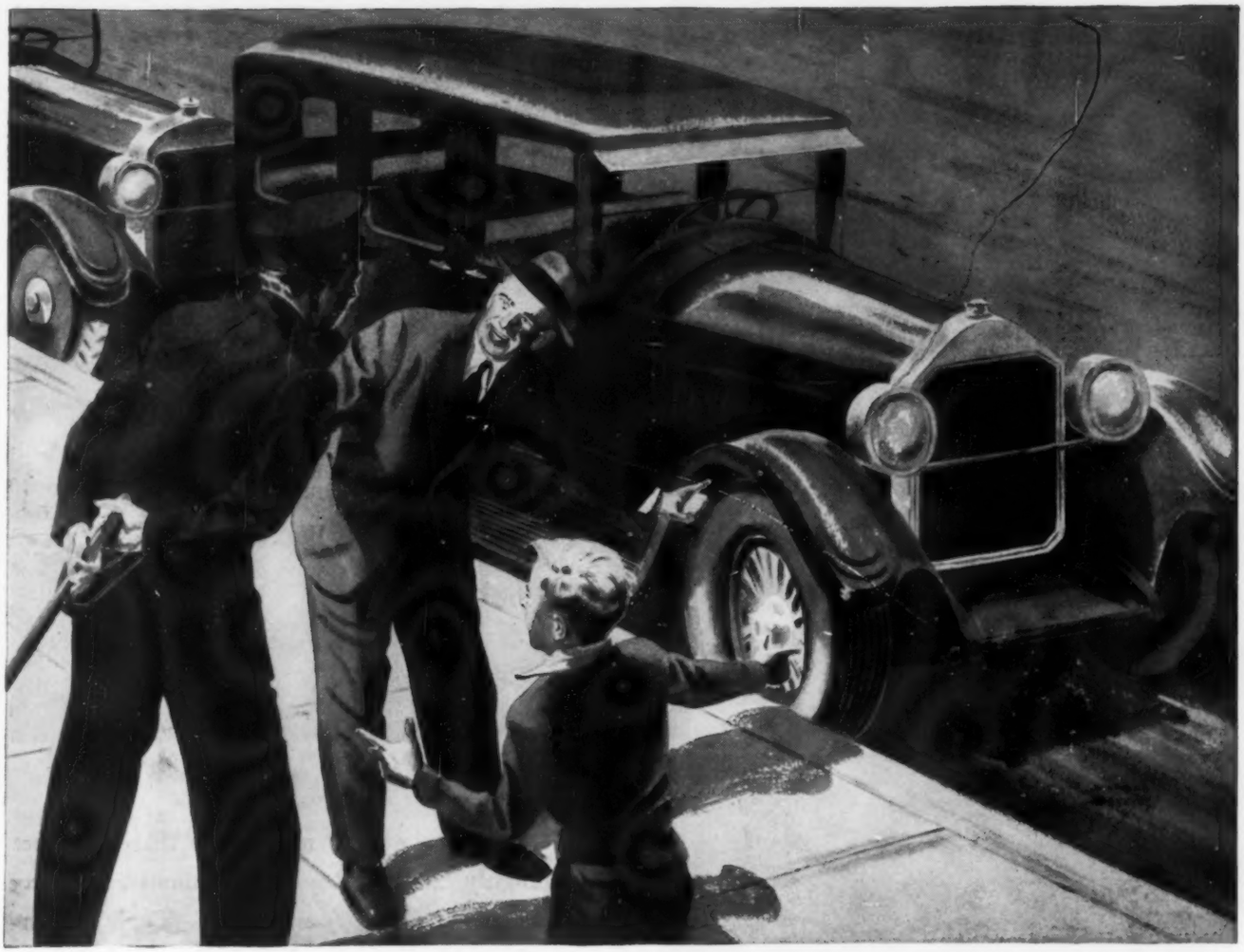
First prize: $500.00; second prize: $300.00; third prize: $200.00. If you feel that you have ideas of value for this contest, be sure to enter! You may win one of these substantial cash prizes.

READ THESE SIMPLE CONTEST RULES:

This contest is open to anyone in the United States or Canada excepting officers and directors of the Chicago Rubber Group for 1943-45. Selection of subject matter is left to the discretion of the contestant. As many papers as desired may be submitted by any one contestant. Papers should be based upon information which has not previously been presented before any technical society meeting or published in any trade magazine. Contest closes at midnight on August 1, 1945. Awards will be made during the fall meeting of the American Chemical Society in Chicago, 1945. The decision of the judges will be final. Each author must submit three copies of his paper to Mr. A. R. Floreen, Vice-President, City National Bank & Trust Company, 208 S. La Salle St., Chicago. These three copies will be judged separately by the Rubber Manufacturers Association, the Rubber Reclaimers Association and the Rubber Division of the American Chemical Society. The judges will report their findings to Bruce W. Hubbard, Chairman, Chicago Rubber Group, 2512 W. 24th Street, Chicago, to whom all inquiries for additional information should be addressed.

Sponsored by CHICAGO RUBBER GROUP, Chicago

Space donated by: Pittsburgh Plate Glass Company • Columbia Chemical Division • Pittsburgh 19, Pa.



"Any road is a Smooth road"

"The new balloon tire gives smooth riding on the roughest roads... smothers all shocks... in fact, any road is a smooth road with balloon tires... it is almost impossible to choose phraseology to drive home the wonderful effect these tires have on riding." Thus wrote an enraptured newsman in the 'twenties when the balloon tire appeared on the scene and created a sensation in the automobile world. And such enthusiasm was fully justified, for this tire not only brought the motoring public new comfort and safety at higher speeds but even inspired radical improvements in the design of automobiles themselves!

Since that time, the balloon tire has been greatly improved. The increased resilience, wear and abrasion resistance that we have learned to expect in modern tires have been made possible in no small measure by Witco's continuing program of research in the development of better carbon blacks, fillers, accelerators, dispersing agents and other rubber compounding materials. Today, Witco products are helping to impart these same qualities to the huge airplane, truck and prime moving equipment tires made of synthetic rubber. Among recent Witco achievements is the production of a special type carbon black that minimizes the danger of overheating and premature failure in synthetic tires. Thus is product improvement through research increasingly important in the chemical service Witco renders not only to rubber, but to paint, ink, paper, plastics and other industries.

WITCO CHEMICAL COMPANY

MANUFACTURERS AND EXPORTERS

[Formerly Wishnick-Tumpeer, Inc.]

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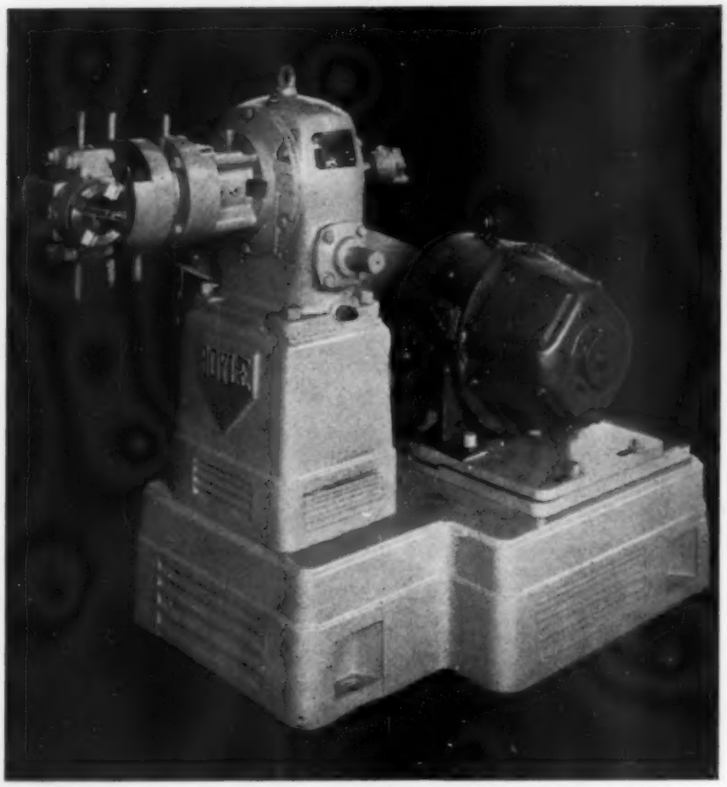
Boston • Chicago • Detroit • Cleveland • Akron • London

Designed for Experimental and Product Extruding



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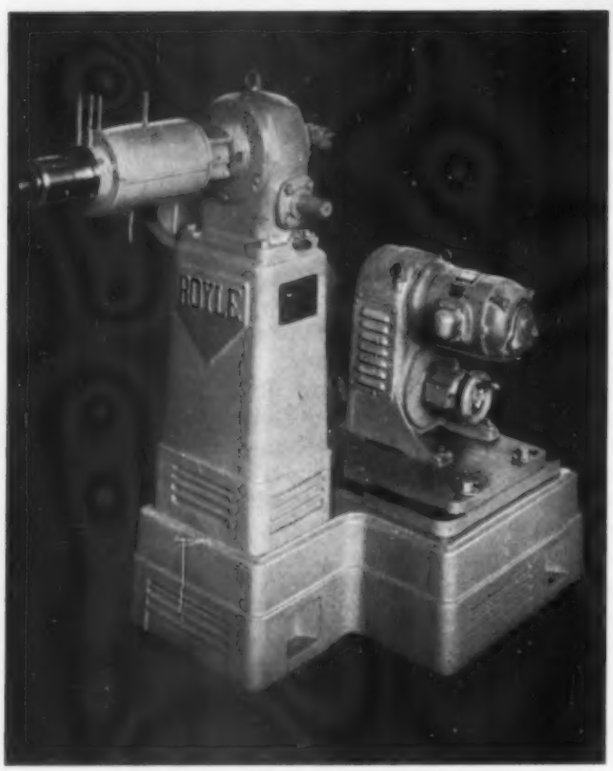

NO. ½

- Rugged is the word to describe these compact and highly efficient Royle Continuous Extruding Machines—the No. ½ and No. 1. Their diminutive size embraces all of the characteristics required for larger and heavier extruding processes.

- Primarily designed to become an integral part of laboratory equipment—the technician can be sure that his experiments will have true relation to actual product extruding — these machines are efficient and economical producers of such products as tubes, rods, fine wire insulation, monofilament and thread coating.

- Except for dimensional differences these machines possess identical characteristics.

JOHN ROYLE & SONS — ROYLE, PATERSON, N. J.

PIONEER BUILDERS OF EXTRUSION MACHINES SINCE 1880

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Akron, Ohio
J. C. Clinefelter
UNiversity 3726

PATERSON 3, NEW JERSEY

NEOPRENE PEPTIZER P-12

A HOT WEATHER NECESSITY

With the Approach of Summer Temperatures, PEPTIZER P-12 Will Become More and More Valuable*

TRY THIS SIMPLE LABORATORY EXPERIMENT. Mix your most troublesome Neoprene Stock. Split the batch. Add 1% or 2% PEPTIZER P-12 to one half. Store the uncured batches at a selected elevated temperature. Take comparative plasticities at intervals until the control is set up. The final plasticity of the experimental stock will be the answer.

Then demonstrate the remarkable processing value of P-12 in a factory batch.

If you are not familiar with NEOPRENE PEPTIZER P-12 we suggest that you ask for literature and samples.

THE CALDWELL COMPANY

2412 First Central Tower, AKRON 8, OHIO

*Patent applied for

SALES REPRESENTATIVES

BOSTON	L. G. Whittemore, Inc. Boston 14, Massachusetts	131 Beverly Street Phone: Capitol 8910
NEW YORK	Robert I. Webber New York 17, New York	52 Vanderbilt Avenue Phone: MUrray Hill 3-6008
TRENTON	H. N. Richards Company, Trenton, New Jersey	1203 East State Street Phone: Trenton 3-4186

DADDY OF THEM ALL—

Largest McNeil-Akron Individual Inner Tube Vulcanizing Unit Ever Built

MODEL 500—85″—30

This Giant Vulcanizer complete with mold weighs approximately 37,000 lbs. and is good for 500,000 lbs. total internal pressure, or up to 125 lbs. per sq. in. in a maximum cavity. This press is 85″ wide between the side arms and will accommodate a mold cavity size up to 22″ in cross section x 76″ outside diameter. The mold shown is for 24.00 x 32 inner tubes such as are used on Giant Earth Mover equipment. Upper mold support platen is adjusted electrically to suit various mold thicknesses. This feature simplifies and speeds up mold changing.

In addition to the 43″ and 85″ sizes illustrated here, we make intermediate sizes, which are 55″ and 75″ respectively between the side frames. All presses of course are designed to take existing molds and provisions have been made to speed mold changing as much as possible

LITTLE GIANT—
MODEL 110—45″—14

Our most popular tube press is this small unit, which is only 45″ wide between the side frames. It is suitable for the full range of passenger sizes as well as all truck tubes up to and including 11.00 x 20. Maximum cavity size 9″ cross section x 40″ O.D.

WRITE FOR DETAILS ON BOTH

THE McNEIL MACHINE & ENGINEERING CO.

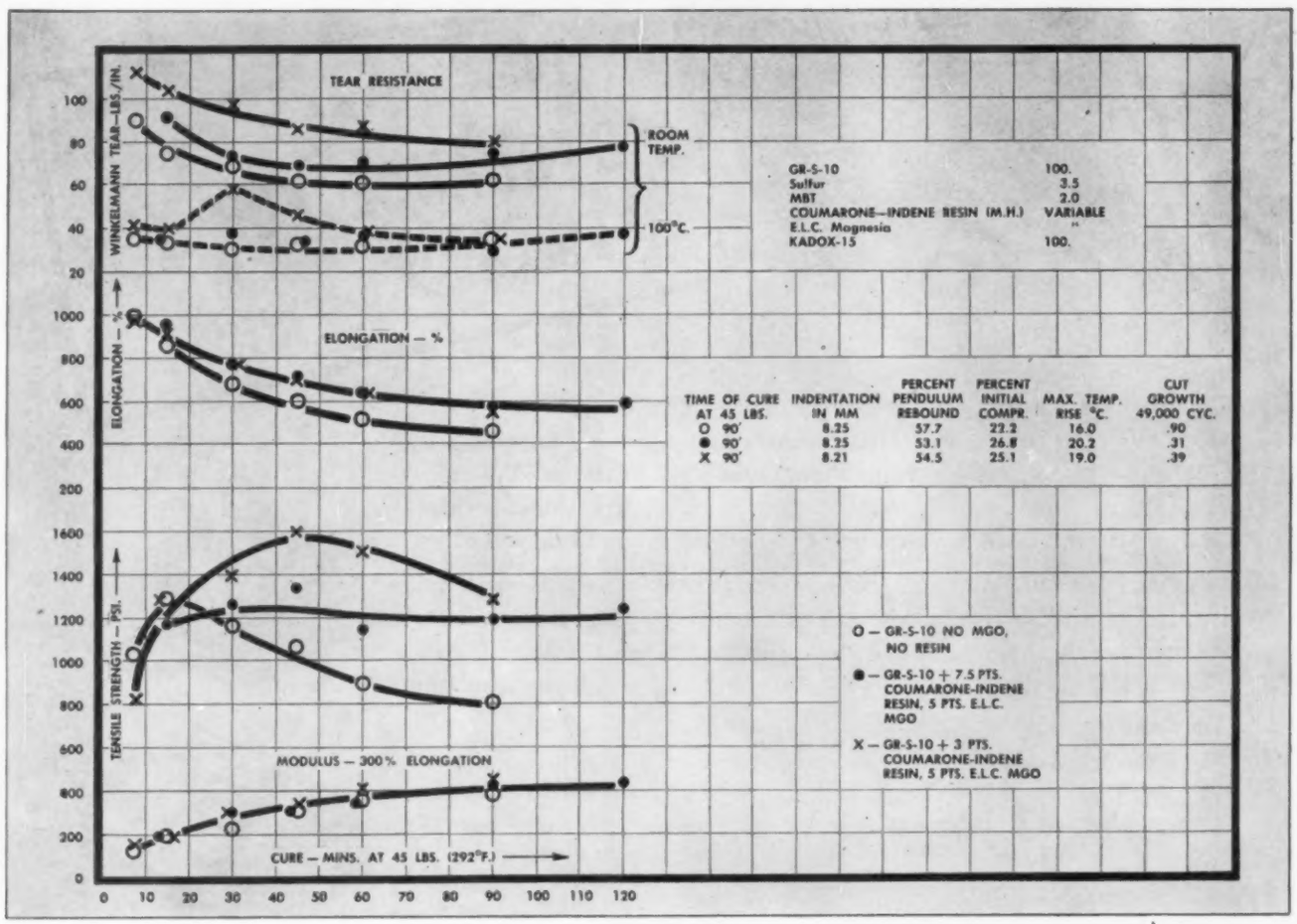
96 EAST CROSIER ST. **AKRON 11, OHIO**

Technical Bulletin No.10 — on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

GR-S-10 (Rosin Soap Polymer)

MBT Acceleration — Effect of the Addition of Coumarone-indene Resin and ELC Magnesia

(Refer to Technical Bulletin No. 9)


TEAR RESISTANCE
WINKELMANN TEAR—LBS./IN.
ROOM TEMP.
100°C.
ELONGATION — %
TENSILE STRENGTH — PSI.
MODULUS — 300% ELONGATION
CURE — MINS. AT 45 LBS. (292°F.)
GR-S-10 100.
Sulfur 3.5
MBT 2.0
COUMARONE—INDENE RESIN (M.H.) VARIABLE
E.L.C. Magnesia "
KADOX-15 100.
TIME OF CURE AT 45 LBS. | INDENTATION IN MM | PERCENT PENDULUM REBOUND | PERCENT INITIAL COMPR. | MAX. TEMP. RISE °C. | CUT GROWTH 49,000 CYC.
O 90' | 8.25 | 57.7 | 22.2 | 16.0 | .90
● 90' | 8.25 | 53.1 | 26.8 | 20.2 | .31
X 90' | 8.21 | 54.5 | 25.1 | 19.0 | .39
O — GR-S-10 NO MGO, NO RESIN
● — GR-S-10 + 7.5 PTS. COUMARONE-INDENE RESIN, 5 PTS. E.L.C. MGO
X — GR-S-10 + 3 PTS. COUMARONE-INDENE RESIN, 5 PTS. E.L.C. MGO

GR-S-10 without plasticizer and ELC magnesia gives an early peak in the curing curve, and tensiles decline quite rapidly as the cure progresses. The addition of 7.5 parts of coumarone-indene resin and 5 parts of ELC magnesia flattens the curing curve over the range 15-120 minutes. However, this amount of resin causes a noticeable increase in the tendency to stick to the back roll. Reducing the resin content to 3 parts corrects this tendency and the physical properties of the compound are considerably improved—especially tensile strength and tear resistance at both room temperature and 100°C.

Uniform Quality
HORSE HEAD
ZINC OXIDES

THE NEW JERSEY ZINC COMPANY
160 FRONT STREET • NEW YORK 7, N. Y.
Products Distributed by THE NEW JERSEY ZINC SALES COMPANY
NEW YORK • CHICAGO • CLEVELAND • SAN FRANCISCO

DETROIT PUBLIC LIBRARY

TO COMPANY PRESIDENTS:

Here's Another
BIG CHANCE FOR YOU
to "Pass the Ammunition!"

Today—thanks largely to you and other industrial executives—22,000,000 civilian workers are speeding victory and achieving postwar security through the Payroll Savings Plan. Over 60% of the 6th War Loan subscriptions came from this source—and, between drives, this forward-looking plan has been responsible for 3 out of 4 War Bond sales!

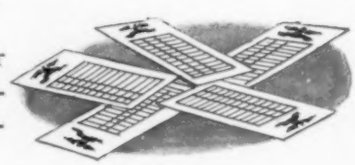
Good as this record is, the Payroll Savings Plan can be still more effective. Believing this can best be accomplished by giving Bond buyers a definite idea of the many benefits accruing to them, the War Finance Division has prepared a variety of active aids for employee education.

This new "ammunition" includes:

a—An entertaining, swift-paced moving picture, graphically showing the importance of buying—and holding—War Bonds.

b—An interesting, easy-to-read booklet, explaining how War Bonds may be accumulated to provide education for children, homes, retirement incomes, etc.

c—Attractive, handy War Bond envelopes, enabling Bond holders to note each separate purchase—and the specific purpose for which each Bond or group of Bonds was bought.

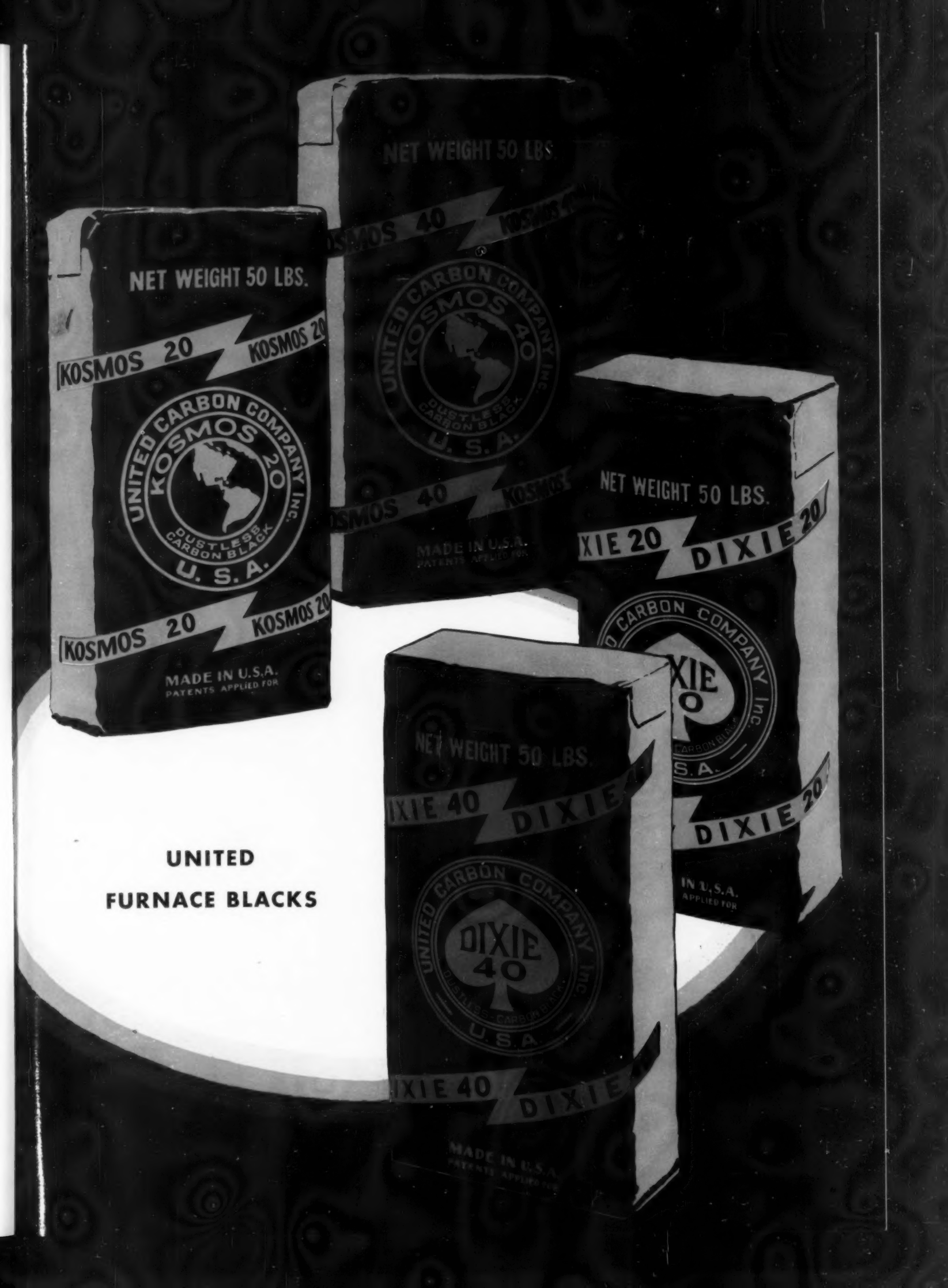


Passing this particular ammunition requires that you reappraise your own company's Payroll Savings Plan. Have your own War Bond Chairman contact the local War Finance Committee—today! They will welcome the chance to discuss this new program with you.

The Treasury Department acknowledges with appreciation the publication of this message by

THE RUBBER AGE

★ *This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council* ★



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FURNACE BLACKS

USE THESE UNITED BLACKS
for
UNIFORM QUALITY AND PERFORMANCE

DIXIE 20 • KOSMOS 20

United Furnace Blacks of the semi-reinforcing (SRF) type. They are ideal for GR-S and other rubbers used in military and civilian goods. Their outstanding features are ease of processing—good plasticity—fast rate of cure—high resiliency and low heat build up. We recommend them for blending with channel black for moderate reinforcement and low heat build up.

•

DIXIE 40 • KOSMOS 40

United Furnace Blacks of the reinforcing (HMF) type for synthetic and natural rubber. They possess a combination of most desirable characteristics, including cool mixing—easy processing—smooth and rapid extrusion—fast rate of cure—full reinforcement—low heat build up and high resiliency. They also possess high resistance to cut growth—flex cracking and abrasion. They are especially useful for tires of all types, pneumatic or solid, under any conditions; tubes; bogie wheels; footwear; and mechanical goods.

•

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FOR UNIFORMITY AND PURITY

IN CHEMICALS FOR THE NEW RUBBERS

SELECT THESE GENERAL CHEMICAL PRODUCTS FOR YOUR REQUIREMENTS:

BASIC CHEMICALS

GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

Sulfuric Acid: All grades and strengths.

Aluminum Sulfate: To precipitate polymerized synthetic rubbers.

Fluosulfonic Acid: For production of Boron Trifluoride.

Potassium Cyanide—Sodium Cyanide: In production of acrylonitrile rubbers.

Sulfur: Commercial Rubbermakers' and other grades.

Copper Fluoborate—Zinc Fluoborate—Copper Cyanide—Sodium Cyanide: Intermediates for "plating" rubber to metals.

Lead Fluoborate: For lead plating in battery manufacture.

Baker & Adamson Reagents and Fine Chemicals

GENERAL CHEMICAL COMPANY

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THE LOEWENTHAL CO.

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Chemically and physically Controlled

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SHELL OIL COMPANY, LTD., 25 ADELAIDE ST., EAST
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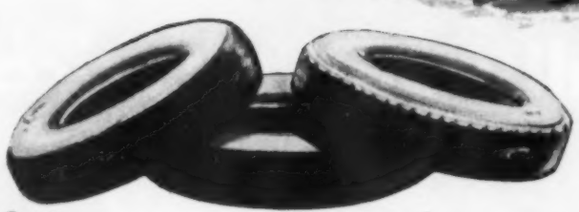
mechanicals

B.R.T.*

for footwear

reclaim



DUAL PURPOSE SOFTENERS AND EXTENDERS

SPECIFICATIONS

	B.R.T. No. 3	B.R.T. No. 4	B.R.T. No. 7
Specific Gravity			
25°C/25°C	1.15 to 1.20	1.15 to 1.20	1.20 to 1.25
Specific Viscosity, Engler			
50 ml at 40°C	13 to 18		
50 ml at 50°C		15 to 30	
50 ml at 100°C			6 to 9
Insoluble in Carbon Disulfide			
% by weight	4 to 10	4 to 10	15 to 20
Water			
% by volume (maximum)	3	3	0.1
Distillation			
to 170°C % by weight (maximum)	5	2	1
to 270°C % by weight (maximum)	25	20	13
to 300°C % by weight (maximum)	35	30	25
Softening Point			
Ring and Ball Distillation Residue at 300°C Degrees Centigrade	30 to 60	35 to 65	35 to 65

Through his selection of B.R.T. softeners, the rubber compounder is offered a choice of refined coal-tar plasticizers with different viscosities, distillation ranges and carbon disulfide insoluble contents. Serving both as softeners and extenders, the value of these products is indicated by their use throughout the rubber industry for mechanicals, footwear and reclaiming.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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The Barrett Company, Ltd.

5551 St. Hubert St., Montreal, Que.

Barrett

*Reg. U.S. Pat. Off.

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PLASTICIZERS AND MODIFIERS

TO HELP THE RUBBER MANUFACTURER

In the extensive line of plasticizers and modifiers developed by The Resinous Products & Chemical Company, the rubber compounder will find aid in solving many of the problems confronting him today. Detailed information and technical assistance in the use of these outstanding products is freely available.

	PLASTICIZER TYPE	BUNA N	NEOPRENE GN (GRM)	POLYVINYL CHLORIDE	POLYVINYL BUTYRAL
ESTER OR MONONERIC TYPES	DIBUTYL SEBACATE	High resilience and outstanding low-temperature flexibility. Excellent drape.	Outstanding low-temperature flexibility. Widely used in both rubber and latex.	Unexcelled for low-temperature flexibility, plasticizing efficiency, resilience and drape in PVC and copolymers. Excellent color stability.	High efficiency, excellent low-temperature flexibility, color and light stability.
	DIBENZYL SEBACATE	Good resilience and low-temperature flexibility. Excellent for stocks subjected to high temperature service.		Outstanding permanence and electrical properties, when used as secondary plasticizer. Low flammability.	
	DIOCTYL SEBACATE			High plasticizing efficiency and extreme low-temperature flexibility combined with permanence at higher temperatures. Excellent dielectric properties.	
	DICAPRYL PHTHALATE	Good plasticizing efficiency. For use in soft stocks.	Permanence, resilience and lasting low-temperature flexibility. Particularly useful for molded goods.	Efficiency, satisfactory low-temperature flexibility and excellent permanence at very low cost.	
	PLASTICIZER 35			Highly efficient. low-cost secondary plasticizer.	Extreme efficiency, excellent permanence and good low-temperature flexibility. Good low-cost, general purpose plasticizer in coated goods.
	PLASTICIZER 36			High efficiency, extreme low-temperature flexibility, low cost, excellent drape.	High efficiency, permanence and good low-temperature flexibility.
POLYESTER OR POLYMERIC TYPES	PARAPLEX G-25	Outstanding for permanence and resistance to extraction by hot oils. Good low-temperature flexibility.		Unexcelled for permanence and resistance to extraction and migration. Superior resistance to weathering, especially ultra violet.	
	PARAPLEX AL-111	Permanence, excellent heat and oil resistance. A low-cost, non-migrating plasticizer.	Permanence, reasonable low-temperature flexibility. Low-cost processing aid, particularly for milling, molding and extruding.		
	PARAPLEX RG-8				Permanence and high efficiency. Low-cost resinous type, well suited to formulation of adhesives for combining, etc. — because of desirable tack.
	SPECIAL TYPES	Resin R6-3 is outstanding for permanence and resistance to hot oils.			AMEROL ST-137, UFORMITE MM-55 and AMBERLITE PR-14 all well suited for thermosetting of PVB compositions, both calender and solvent types.

PARAPLEX, AMBEROL, UFORMITE and AMBERLITE *are trade-marks, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, S.R.L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

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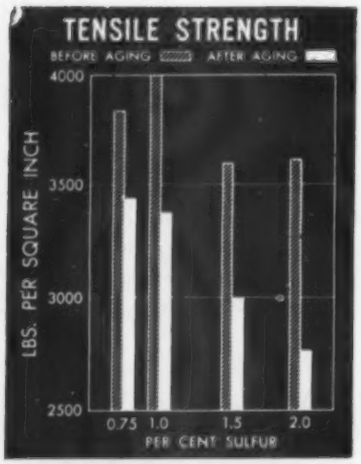

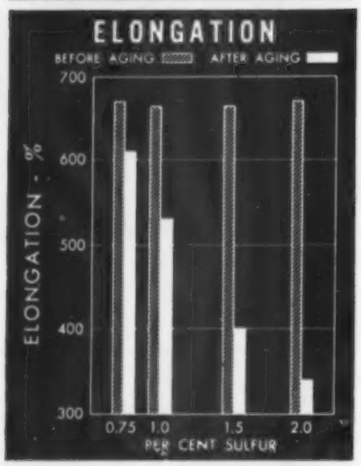

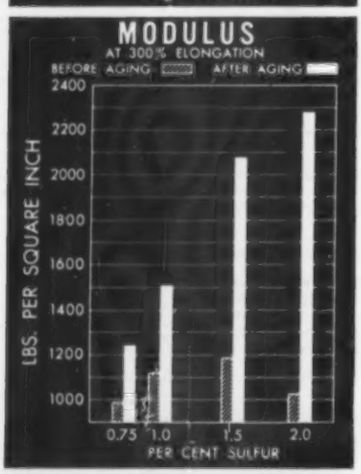

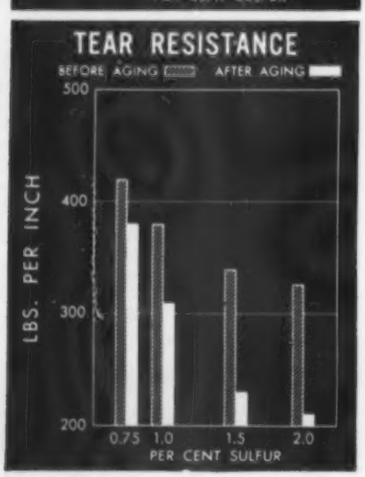

Give your GR-S Compounds heat stability provided by low sulfur content

Safe, fast curing now made possible by FBS LITHARGE

As you know, reduction in sulfur content means increase in heat stability.

It has now been demonstrated that FBS litharge (plus benzothiazyl disulfide) makes low sulfur formulas practicable.

Why?

Because it speeds up greatly the rate of cure without increasing the risk of scorching.

Thus, even though the normal quantity of accelerator is used, *the sulfur content can be reduced.*

Note, in the series of tests charted and tabulated, the superior behavior of the 0.75 and 1.0 sulfur formulas.

FORMULA

GR-S (Institute)	100
E.P.C. Carbon Black	50
Zinc Oxide	3
Coal tar softener	5
Benzothiazyl Disulfide	1.0
FBS Litharge	1.5
Sulfur	variable

Effect of Varying Amounts of Sulfur on Physical Properties

(Curing period: 20 min. Temp: 287° F.)

% Sulfur	*Tensile Strength*	*% Elongation*	*Modulus at 300% Elong.*	*Tear Resistance*
0.75	3840	670	980	420
1.0	4000	665	1120	380
1.5	3600	665	1190	340
2.0	3620	670	1025	325
After Aging 24 Hours at 100° C.				
0.75	3460	610	1240	380
1.0	3380	530	1510	310
1.5	3000	400	2080	230
2.0	2770	340	2280	210

CONCLUSIONS:

1. FBS Litharge-thiazole with low sulfur imparts heat stability.
2. Modulus is high and steady.
3. Elongation is retained despite exposure to heat.
4. Heat stability prevents brittleness and improves tear resistance.
5. Rate of cure is relatively fast, without tendency to scorch.
6. The combination is inexpensive and efficient.

Ask us to send you a printed report, "Compounding of GR-S for Heat Resistance," issued by the Rubber Division of our Research Laboratories, which covers the subject of FBS Litharge for low sulfur formulae in greater detail and from a number of additional angles.

NATIONAL LEAD COMPANY New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

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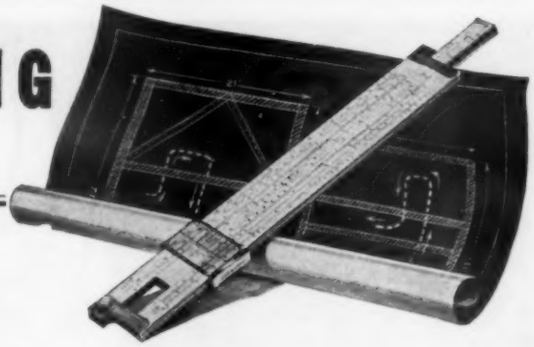
OVEN ENGINEERING NEWS



IOE Rubber and Synthetic Tire Processing Equipment Speeds Production, Cuts Cost, And Ends Operating Hazards

The Industrial Oven Engineering Company designs, engineers, manufactures and installs complete materials handling and oven processing systems for the rubber and synthetic fabricating industries.

Many **IOE** installations have offered the first satisfactory solutions for difficult processing problems. For instance, **IOE** fabric cementing systems have eliminated the fires and explosions which were once a daily occurrence in plants manufacturing tires of synthetic rubber.

IOE continuous cord dipping equipment for weftless or woven rayon, cotton or nylon tire fabric is installed directly in the calender train and processes the fabric at high calendering speed as one continuous controlled operation.

IOE curing ovens have changed the curing of bulky objects like aircraft fuel cells from a slow, semi-manual operation to a fast, continuous, automatic process.

Whether the requirements cover tire fabric processing, continuous cementing, cord drying or curing, an **IOE** installation embodies progressive engineering, rugged construction and accurate control.

WE MAKE:

Complete Fabric Cementing Systems
Complete Tire Fabric Latexing Systems
Continuous Takeup and Payoff Stands
Dip Tanks Drying Ovens Creel Rooms
Constant-Speed, Constant-tension Extrusion Takeup Machines for Plastic Resin Hose and Cords, Rubber Tubing, V-belt Cord and other continuous materials
V-belt Cord Dryers Curing Ovens
Extrusion Takeups Spreader Takeups

Write for this reprint of our Rubber Age article, "High Speed Handling and Drying in the Cementing of Tire Fabric," describing the operation of a complete tire fabric cementing system. FREE.

"Blueprint for Industry — Part II" describes convection-heated oven systems now in the rubber and synthetic industries. FREE.

"Blueprint for Industry—Part III" gives full engineering information on the **IOE** *constant-speed, constant-tension windup machine for all continuous materials. FREE.*

(This is No. 19 of a series. Reprints of previous advertisements sent free upon request.)

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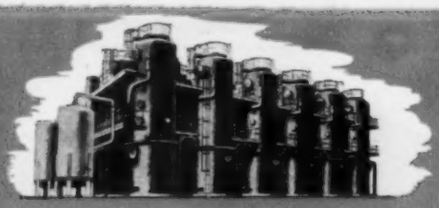
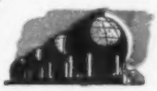


UNION CARBIDE *AGAIN* REPORTS

on the production of

BUTADIENE

for the Government's Synthetic Rubber Program



ONE OF THE MOST IMPORTANT factors in the Government's rubber program is the production of GR-S type synthetic rubber. The basic chemical in this rubber is Butadiene, which can be made from alcohol or hydrocarbon materials.

The Government's original plan provided that about one third of the required Butadiene would be made by CARBIDE AND CARBON CHEMICALS CORPORATION'S alcohol process.

In 1943, their first year of operation, however, the plants using this process produced over 75 per cent of all Butadiene made for GR-S type synthetic rubber.

In 1944, the second year, these plants produced about 64 per cent of all Butadiene necessary for military and essential civilian rubber. This was true despite the fact that good progress had been made in the production of Butadiene by other processes.

THE RECORD

The first tank-car load of Butadiene was shipped from the Government's Carbide-built, Carbide-operated plant at Institute, West Virginia a little over two years ago.

This was just five months after the famous Baruch Committee Report pointed out this nation's desperate need for rubber—and approved Carbide's butadiene alcohol process, originally selected by Rubber Reserve Company, as one of the solutions.

In its first year the Institute plant, with a rated capacity of 80,000 tons per year, produced enough Butadiene for more than 90,000 long tons of synthetic rubber.

Two more great plants using Carbide's alcohol process—and built from the blueprints of the Institute plant—are in full production. One of these, with an annual rated capacity of 80,000 tons of Butadiene is located at Kobuta, Pennsylvania and is operated for the Government by another important chemical company.

The second, with a rated capacity of 60,000 tons a year, is operated for the Government by Carbide at Louisville, Kentucky—making the total rated capacity of the two huge plants now operated by Carbide 140,000 tons a year.

In 1944, the production of Butadiene from the three plants using the alcohol process totaled 361,000 tons—representing operation at over 164 per cent of rated capacity. An even higher rate is expected in 1945.

* * * * *

Before Pearl Harbor, the United States was a "have not" nation with respect to rubber. Now, thanks to American research, engineering and production skill, our country can take its place as a dominant factor among the great rubber producing nations of the world.

▼

Business men, technicians, teachers, and others are invited to send for the book RU-2 "Butadiene and Styrene for Buna S Synthetic Rubber from Grain Alcohol," which explains what these plants do, and what their place is in the Government's rubber program.

SEPTEMBER 10, 1942

"Of all the critical and strategic materials, rubber is the one which presents the greatest threat to the safety of our nation, and to the Allied Cause . . . We find the situation to be so dangerous that unless corrective measures are taken immediately the country will face both a military and a civilian collapse."

—Report of the Rubber Survey Committee (Baruch Committee).

AUGUST 31, 1944

"Undoubtedly the outstanding achievement of your company has been the development of your process for the production of Butadiene from alcohol. With a rather meager background of experimental work, your engineers were able to design and construct commercial units for the production of Butadiene. In an exceedingly short time, the operation of this equipment at capacities up to 200 per cent of rating has been largely responsible for our present safe situation with respect to rubber supplies . . ."

—Letter from Rubber Director Bradley Dewey to CARBIDE AND CARBON CHEMICALS CORPORATION

The material herein has been reviewed and passed by the Rubber Reserve Company, the Defense Plant Corporation, and the War Department.

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Resistance to aging

Dielectric strength

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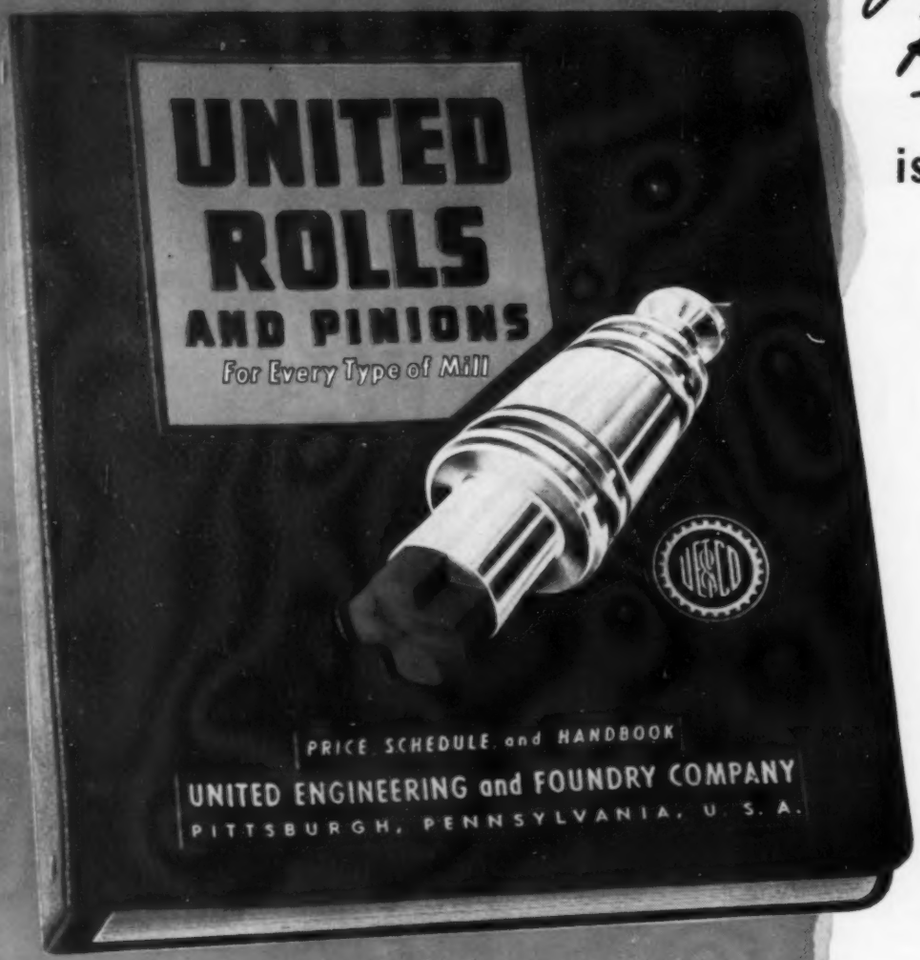
for the Rolling Industry



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Just off the press. It's new, authoritative, up-to-the-minute. And it's packed with authentic technical and metallurgical information for those engaged in the rolling of ferrous or non-ferrous metals or other materials. The various types of rolls most successfully used in today's modern rolling operations are fully described.

It lists and illustrates the 15 principal classifications of rolls manufactured by United Engineering and Foundry Company, together with the necessary data, grade designations, and prices to make selection of the right roll for your particular requirement easy and positive. And there is a complete section devoted exclusively to tables and charts packed with information valuable to users of rolls in every industry.

The edition is limited. So better mail your request today!

There's a UNITED ROLL for every Rolling Requirement

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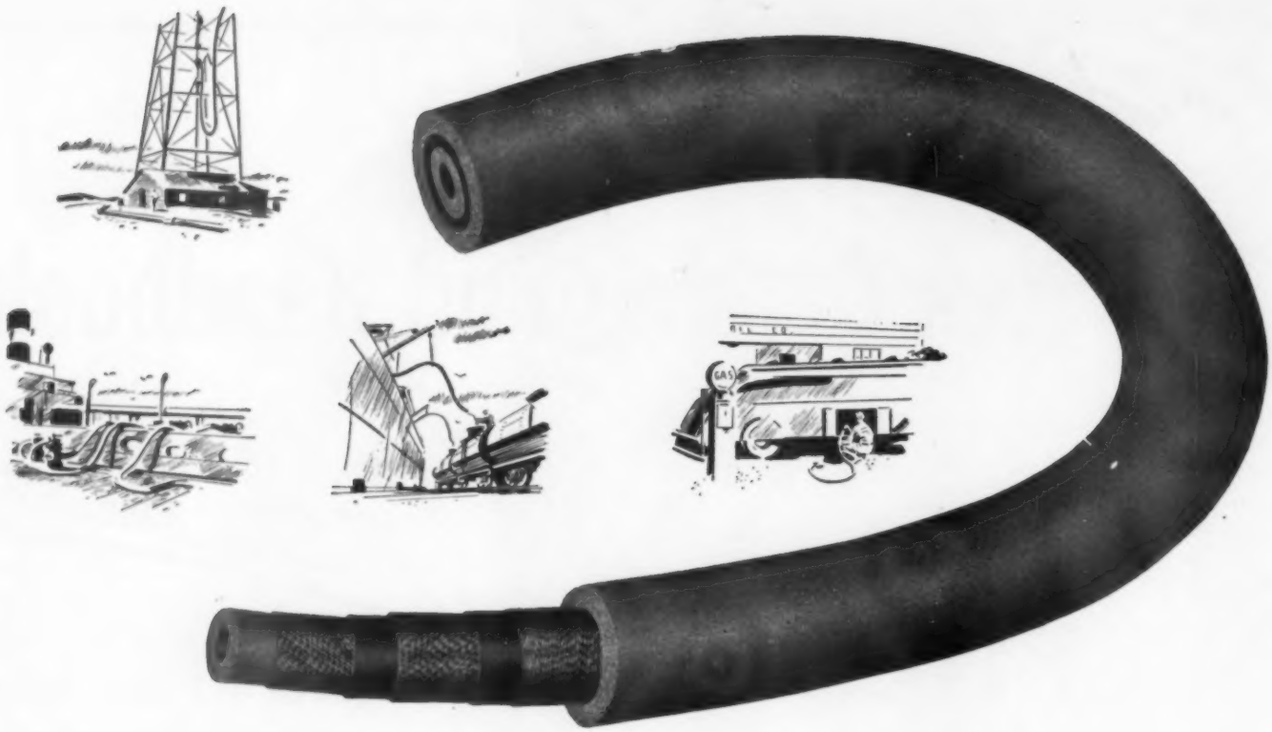

BACKBONE...
For a High Pressure Hose

OIL well rotary drilling hose has to take pressures up to 5,000 pounds, stand up under constant flexing and re-flexing, carry heavy volumes of fast-flowing mud to lubricate the drilling. It takes plenty of *backbone* to hold up under that kind of strain, and so in this hose, as in many other types, the backbone is steel wire.

Only the highest quality steel *wire* can provide the necessary reinforcement for strength and long life . . . its use in fabricated form helps provide the highest degree of flexibility necessary for this rugged service.

That's why most leading hose manufacturers have consistently specified braided *steel wire* especially developed with essential characteristics for hose reinforcement.

Developing and producing that kind of wire has been National-Standard's main job since the early days of the rubber industry. Close cooperation between rubber engineers and National-Standard wire experts has resulted in uniform high quality wire for many types of hose, brought forth time-saving, cost-reducing machinery for the application of wire into finished products, and has lead to many *new* uses for wire with rubber. Tires, airplane de-icers, conveyor belts, V-belts, and tubing are only the beginning of even greater wire-and-rubber developments to come.

If you have plans for product improvement or development, let National-Standard's experience help with a type of wire and method of application specifically fitted to your product.

BUY AND KEEP WAR BONDS

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WORCESTER WIRE WORKS
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ROUND STEEL WIRE, SMALL SIZES

"Controlled Quality" MEANS TOP PERFORMANCE

In these times of extreme demands upon the capacities of the nation's rubber industry, dependability in chemical supplies is more essential than ever. Cyanamid's "controlled quality" standards *PLUS* the strategic locations of Cyanamid "stock points" assures a dependable, convenient and well-rounded service to the rubber industry that is helping to maintain fast, economical processing schedules for the war effort and essential civilian uses.

AERO AC 50**
AERO BRAND DOTG
AERO BRAND DPG
AERO* BRAND ACRYLONITRILE
AERO BRAND RUBBER SULPHUR
K & M MAGNESIUM OXIDE
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"When performance counts . . . call on Cyanamid"

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American Cyanamid & Chemical Corporation

(A Unit of American Cyanamid Company)

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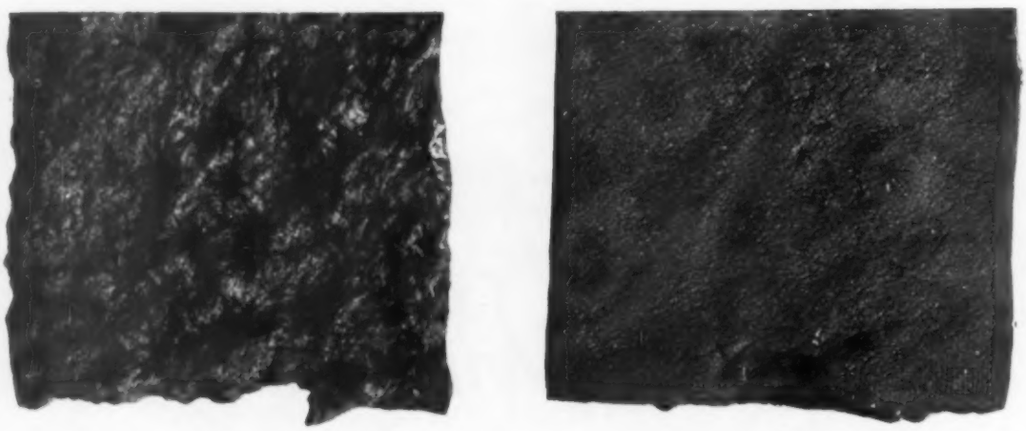
DIELEX in Reclaim Rubber

	A	B
Carcass Reclaim	100	100
Dielex	—	10



A B

Photograph of uncured stocks

Dielex will plasticise and smooth out reclaim rubber without producing undue tackiness on the mill.

Samples and technical data available.

HERRON BROS. & MEYER

82 BEAVER ST., NEW YORK 5, N. Y.

516 OHIO BUILDING, AKRON, OHIO

SUPPLIERS OF RUBBER CHEMICALS

Wartime needs have emphasized the value of two Columbia pigments—Calcene T and Silene EF—in producing a variety of highly desirable properties in GR:S and other rubbers.

Silene EF, a white, extremely finely divided calcium silicate, confers high modulus, hardness, tear-resistance and good tensile strength up to high loadings. Its value has been particularly evident in the manufacture of inner tubes, colored abrasion goods and many molded products.

Calcene T, a coated precipitated calcium carbonate product of fine particle size, confers low modulus, good tensile strength, good resistance to tear and abrasion, fast extrusion and good processing properties. Its use with GR:S in wire insulation stocks is but one example of its wide utility.

Under certain conditions, Silene EF and Calcene T are used together to enable the compounding of stocks such as those required for "no-mark" soles and heels.

SEND FOR DATA

Reports of extensive research are available on request, together with samples for experimental purposes. If you have a specific problem, data will be assembled which pertains to the particular field in which it lies.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING · PITTSBURGH 19, PA.

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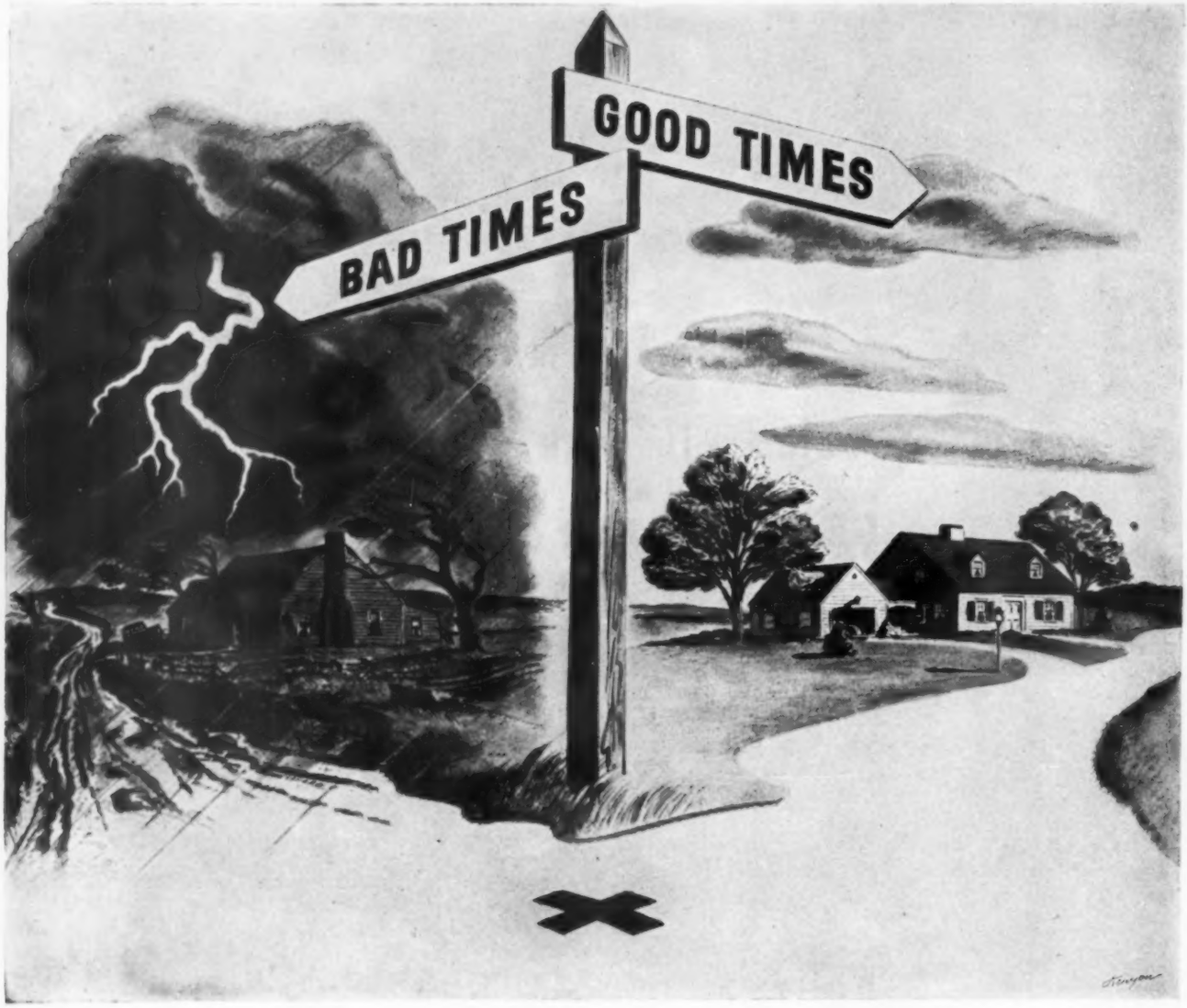


Here's where you stand today!

Look ahead a year or two...for your own sake.

Over on the dark side is this: Every unnecessary thing you buy helps shove the country one step nearer inflation and the bad times that come in inflation's wake.

Over on the bright side is this: Every single cent you save helps move you and your country one step nearer the kind of prosperous, happy, post-war America you want.

Okay—you're human. You're thinking mainly about yourself.

YOU SHOULD. Because if every man Jack (and every girl Jill) buys nothing he can get along without . . . (avoids Black Markets and "just-a-little-above-the-ceiling" like the plague!) . . . pays off the mortgage or any other debts . . . takes out more insurance . . . builds a healthy sock of savings . . . buys and holds more War Bonds—inflation will stay away from our door.

And Jack and Jill will be in a sound position no matter what times come.

Maybe you ought to clip this signpost and paste it in your pocketbook as a reminder that you can BUY your way to bad *times. Or you can SAVE your way to* good *ones.*

That's where YOU stand today.

4 THINGS TO DO to keep prices down and to protect your own future!

1. Buy only what you really need.

2. When you buy, pay no more than ceiling prices. Pay your ration points in full.

3. Keep your *own* prices down. Don't take advantage of war conditions to ask more for your labor, your services, or the goods you sell.

4. *Save.* Buy and hold all the War Bonds you can afford—to help pay for the war and protect your future. Keep up your insurance

HELP US KEEP PRICES DOWN

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

SYNTHETIC RUBBER LATICES
COMPOUNDED AND UNCOMPOUNDED

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, NEW YORK 20, N. Y.

In Canada: DOMINION RUBBER COMPANY, LTD., MONTREAL

Maybe it isn't a mistake...

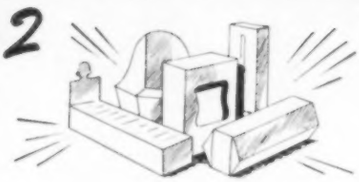
IT GIVES ME AN IDEA

and it's an idea every carton user will want to grab who's looking for extra sales, in tomorrow's open displays and self-serve stores

1

FOR COLOR BRILLIANCE has a lot to do with making a package stand out, catch eyes . . . say, "Take me home." Pick up or impulse sales already add up to over 50% of the volume in thousands of stores. And this help-yourself, reach-for-it trend is headed UP. Tomorrow, your folding carton will need the extra attention it can get—with *Coated* Lithwite.

2



ON COATED LITHWITE CARTONS, colors show up more brilliantly. For the surface of this revolutionary, one-process coated board is unusually white. Uniform. Hard. Smooth. Free from chalkiness. It forms a perfect base for plates and inks. It reproduces product illustrations with a sharp realism that gives a buying urge.

3

PROVED AND IMPROVED for six straight years. *Coated* Lithwite is the original paperboard made and coated in one continuous, high-speed operation. And its margin of quality leadership has been lengthened by constant refinements. In addition to its finer printing qualities, *Coated* Lithwite folds and scores without flaking or shattering, takes a tight seal —means fewer jam-ups in filling machines.

4

FINE PRINTING STANDARDS FOR MASS-PRODUCED CARTONS. Add Gardner-Richardson's fine press work, exact methods, skilled plate-making, careful make-ready and thorough checking to the natural advantages of *Coated* Lithwite—and you can understand why many of America's leading carton users specify G-R *Coated* Lithwite cartons.

DON'T HESITATE TO CHANGE YOUR PACKAGE. Your competitor won't be afraid to change his. He knows how important a smart, modern, *attract*-ive folding carton will be in tomorrow's open displays and self-serve shelves. Put your problem up to Gardner-Richardson's engineers, designers, merchandising experts, now. While no new orders for *Coated* Lithwite can be filled at this time, G-R skill, know-how and ingenuity is ready to tackle your folding carton problem, come up with an answer that will mean better display, better sales for you, tomorrow. Write, today. Tell us where you'd like help.

The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard

MIDDLETOWN, OHIO

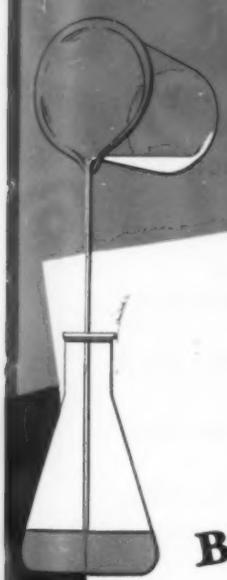
Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

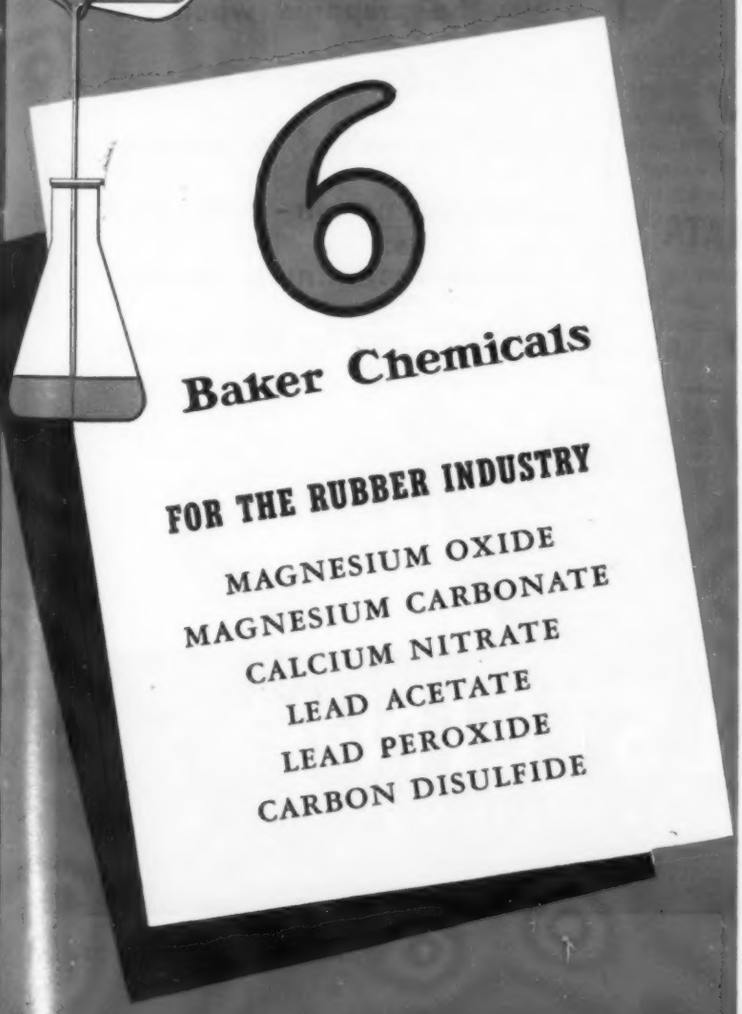
A typical example of

B. F. GOODRICH DEVELOPMENT IN RUBBER

"The jagged holes were made by machine gun bullets that went right on through, but the tire didn't go flat. . . . Even with the air gone the tire itself will support the load and run forty miles before going flat."

Photograph courtesy of B. F. Goodrich.





When Rubber is

MORE THAN RUBBER

New Qualities Long Hoped for Developed in Various Synthetics

Out of our war-time shortages of natural rubber have come many synthetics that render a greater service. And here's the major reason. These synthetics were custom-built to *specific* rather than general needs.

The J. T. Baker Chemical Co., in step with the changing chemical needs of those who work with rubber, has been going along with this expanding technology. When chemicals were required to give synthetics certain qualities, Baker frequently made these chemicals to the rubber industry's defined specifications.

Today, Baker not only supplies large quantities of Calcined Magnesia to meet the exacting requirements of Neoprene compounders, but also Magnesium Carbonate for its reinforcing qualities and high tensile strength.

Baker makes four other sales leaders for the rubber industry to predefined specifications: Calcium Nitrate, Lead Acetate, Lead Peroxide and Carbon Disulfide.

If you have need for one or more of these chemicals—or require a special chemical custom-built to your own rigid specifications, we urge you to write. Our chemical, technical and executive staffs are at your service. Your inquiry will be treated in strict confidence.

J. T. Baker Chemical Co., *Executive Offices and Plant:* Phillipsburg, New Jersey. *Branch Offices:* New York, Philadelphia and Chicago.

Baker's Chemicals

C. P. ANALYZED • FINE • INDUSTRIAL

Have you entered the Chicago Rubber Group Contest?

NOW and for the FUTURE

SYNTHETIC · CRUDE · SCRAP
Rubber

ALSO

HARD RUBBER DUST and BALATA

LET US SERVICE YOUR
RUBBER RESERVE PERMITS

Change is inevitable. • Will you be prepared when the transition comes? • Why not avail yourself of our comprehensive, nation-wide and up-to-the-minute service, NOW... and for the FUTURE.

Consult Our Nearest Office

H. MUEHLSTEIN & Co. INC.

122 EAST 42nd STREET, NEW YORK 17, N. Y.

CHICAGO: 327 So. La Salle St. • AKRON: 250 Jewett St. • LOS ANGELES: 1431 E. 16 St. • MEMPHIS: 46 W. Virginia Ave. • BOSTON: 31 St. James Ave.

CHALLENGE

To those responsible for new products development

RESEARCH men of rubber and plastics have a responsibility—the responsibility of creating out of the developments of chemistry remarkable new products and materials for present and post-war uses. PICCOLASTIC —the new series of styrene resins offers a challenge to the genius of these men. Because of its wide assortment of melting points, molecular weights and solvencies, it is extraordinarily versatile in its applications. In fabric and paper coatings and laminations, insulation, pressure sensitive and heat-sealing adhesives, moldings, impregnants and in plasticizing ability, PICCOLASTIC opens astounding opportunities in industrial fields hitherto undreamed. Complete data and samples on request.

PICCOLASTIC

STYRENE, SUBSTITUTED STYRENE AND HOMOLOGUES

PICCOLASTIC

A Product of Pennsylvania Industrial Chemical Corporation

STANDARD Chemical Company

General Offices: AKRON 8, OHIO

IMAGINE delivering .50 caliber machine gun cartridges to a battery of 105 mm. cannon! Somebody would catch the devil—and it wouldn't be the enemy!

YOU'VE got to have *dependable uniformity* in solvents too. Any variation in the type of solvent you are using for a given job can easily throw your entire production out of line.

That's one of the reasons for specifying SKELLYSOLVE. A given type of SKELLYSOLVE ordered tomorrow will be identical with the same type bought yesterday. You can depend on that. In refining SKELLYSOLVE, we depend on accurate, scientific, instrumented quality control that leaves nothing to guess and hurdles the element of human error.

SKELLY

SKELLYSOLVE
in the
RUBBER INDUSTRY

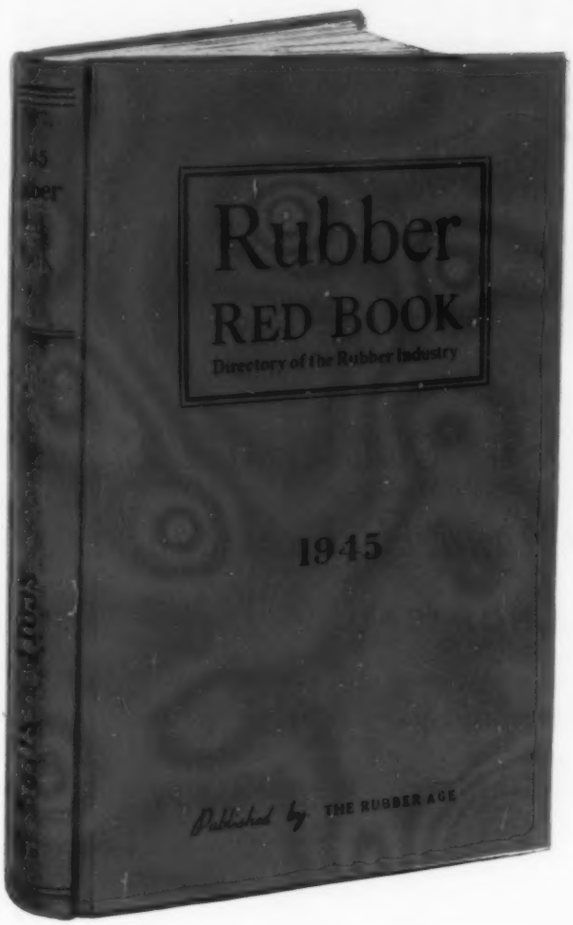
There are six different types of Skellysolve which are especially adapted to various uses in the rubber industry, for making rubber cements, and for many different rubber fabricating operations. Skellysolve offers many advantages over benzol, rubber solvent gasoline, tuluol, carbon tetrachloride, etc. It will pay you to investigate Skellysolve. Write today.

SKELLYSOLVE

SOLVENTS DIVISION, SKELLY OIL CO.
SKELLY BLDG., KANSAS CITY, MO.

CLOSING DATE
Extended to
JUNE 1, 1945

Plan Now for Space in the 1945 RUBBER RED BOOK!



The Fifth Issue of the RUBBER RED BOOK —the 1945 Edition—is scheduled for publication late this summer.

This edition will be completely revised and enlarged, and will reflect the many changes in plants, products, materials and personnel which have taken place in the rubber industry during the past two years.

Already many former advertisers, without waiting for any announcement, have ordered space in the new edition. Hundreds of requests have also been received from users who are anxious to get copies of the 1945 issue.

All of this advance interest indicates that the 1945 issue will be in greater demand than any previous edition and accordingly our print order will be increased to take care of the needs of the industry.

In a few short years the RUBBER RED BOOK has become the indispensable buyer's guide for the whole industry. Hundreds of letters testify to the fact that rubber plant purchasing agents, chemists, engineers, as well as Government procurement agencies and laboratories, use this book as their primary source of buying information. As a result, suppliers have found that the use of space in the RUBBER RED BOOK is an effective means of calling their products to the attention of these key men —and at a low cost, too!

Space Limited This Year

Advertising space in the 1945 edition will be limited due to the necessity of staying within our paper quota. Therefore we urge all suppliers contemplating the use of space in this edition to send in their reservations early for no advertising will be sold after the limit of the available space is reached.

Rate cards and order forms have been mailed to all suppliers. If you did not receive a copy, write for one today. In the meantime, brief rate data is included in the accompanying box to assist you in determining your needs.

Send in your order early! Closing date is June 1.

Published by

RUBBER AGE

250 W. 57th St., New York 19, N. Y.

1945 EDITION
Cost of Space

1 page	$100.	2 pages	$190.
½ page	55.	2 half pages	106.
¼ page	30.	2 ¼ pages	58.

Colors — Red ..... extra, 30.
Other Colors ..... extra, 40.
Bleed Pages, ... extra, 20%
Inserts — Not Accepted

For complete rates and mechanical requirements, write for rate card

COLITE CONCENTRATE

A High Quality Concentrated Liquid Mold and Mandrel Lubricant . . .

EXTREMELY ECONOMICAL

- Simplifies the removal of cured rubber and plastics from the molds.
- Results in a transparent satin-like finish.
- Does not build up on the molds.
- Non-Toxic, non-tacky, odorless.

A Direct Source for Zinc Stearate and other Metallic Soaps

THE BEACON COMPANY

PURITY · UNIFORMITY · DEPENDABILITY

Chemical Manufacturers

97 BICKFORD STREET · BOSTON, MASSACHUSETTS

In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST., W. MONTREAL

BAKER®

PLASTICIZERS

for

Vinyl Resins

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Melamine Resins

Urea-Formaldehyde Resins

Styrene Resins

and

Buna-S

Buna-N

Neoprene

THE
BAKER CASTOR OIL COMPANY

Established 1857

120 Broadway, New York 5, New York

Chicago, Illinois

Los Angeles, California

● BAKER PLASTICIZERS CONTAIN NO PHTHALATE

Here is another reason why FARREL-BIRMINGHAM *should handle your* BANBURY REPAIRS

Applying hard surfacing material to rotor collars.

Welder hard surfacing Banbury door top.

If rotors are too badly worn . . . if metallurgical tests indicate welding inadvisable for lasting repair of insides of chamber bodies . . . or if dust stop rings, end-thrust adjustment, connecting gears, etc., need replacing — ***you must have new parts.*** And what's more, in most cases these parts must be identical with the parts used in new machines.

We can furnish these . . . usually from stock. As developer and manufacturer of the Banbury Mixer we know ***why*** each part is made the way it is, and we have the ***necessary*** drawings to ***duplicate*** any original part of the machine. This is important if the machine is to be returned to original efficiency.

However, this is not the only way in which you benefit when you ask us to handle your repairs. Our many years of experience in overhauling, repairing and rebuilding worn Banburys have taught us many ways of "saving" badly worn parts. This means that parts are replaced only when absolutely necessary.

Take the short road to satisfaction

Racks and racks of new rotors, ready for use.

For better Banbury repairs, call the Farrel-Birmingham service man in your territory.

In the East, call—
WALTER D. TAYLOR
Farrel-Birmingham Company, Inc.
Ansonia, Conn.
ANSONIA 3600

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Farrel-Birmingham Company, Inc.
2710 First Central Tower, Akron 8, Ohio
JEFFERSON 3149

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles

call Farrel-Birmingham

WHITE
Rubber
OUTLOOK...
Rubber manufacturers who took pride in the appealing brilliance of their pre-war white and tinted rubber products may look to the future with confidence.
When natural rubber again is available in quantity TITANOX will be in a better position than ever to play its important role in the making of whiter and brighter rubber goods.
The high tinting strength, fine particle size and reinforcing qualities of TITANOX pigments again will contribute to more desirable finished products.
Meanwhile the TITANOX laboratories are turning their full energies to the solution of the problem of whitening synthetic rubber compounds.
Pending the realization of success in these studies it is well to remember that as TITANOX has the greatest whitening effect on natural rubber so also it has on synthetic and reclaim.
Our Rubber Service Department invites technical inquiry.
TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York 6, N. Y.
104 South Michigan Ave., Chicago 3, Ill.
350 Townsend St., San Francisco 7, Cal.
2472 Enterprise St., Los Angeles 21, Cal.
TITANOX
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Piccolastic resins

Based on Styrene, substituted Styrenes and Homologues

Provide new and improved characteristics

PICCOLASTIC GRADES
Piccolastic Resins · Number Schedule

A Soft Plasticizing	B Hard Brittle	C Flexible	D Hard Tough	E Flexible to Tough	F Hard Horny in Solvent
A-5	....	C-5	....	....	....
A-25	....	C-25	....	....	....
A-50	B-50	C-50	....	E-50	....
A-75	B-75	C-75	D-75	E-75	....
....	B-100	C-100	D-100	E-100	....
....	....	C-125	D-125	E-125	....
....	....	....	D-150	....	FT, FX, FHF

KEY TO NUMBERING CHART:—The numbers opposite each of the letters refer to the approximate Melting Point of the resin in °C, Ball and Ring Method. All members of the A, B, C, D and E series are solid resins, containing all non-volatile matter.
The F series each contains 55% of a resin of approximately 150°C melting point, dissolved in 45% of an aromatic solvent. FT contains Toluol (when available), FX contains Xylol and FHF contains High Flash Naphtha.

PICCOLASTIC
STYRENE, SUBSTITUTED STYRENE AND HOMOLOGUES

In the rubber industry, the new Piccolastic Resins offer a means of getting results hitherto unobtainable. The various types of these thermoplastic hydrocarbon resins provide an almost unlimited range of properties because they may be readily intermixed or combined with other plastic bodies. Most are pale color, suitable for the majority of uses. Molecular weights, solvencies, melting points and other physical properties vary in the several types, over a wide range, but are fixed and dependable for any one type.

Preliminary investigations have shown decided advantages are to be gained by the use of Piccolastic Resins for rubber compounding, plasticizing and extending, for making adhesives and laminating agents of many types, electrical insulating materials and other products. Additional fields in which Piccolastic provides desirable characteristics will occur to the manufacturer investigating newly developed materials or processes for future use.

Extensive knowledge of resin syntheses and their application to the requirements of the rubber industry have been gained by our staff through years of research and field experience. This knowledge is available to help you make most effective use of Piccolastic in your operations.

Write for descriptive bulletin giving complete data and physical properties of Piccolastic.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION
CLAIRTON, PA.
Makers of: Coumarone Resins · Coal Tar Naphthas · Rubber Plasticizers · Reclaiming Oils · Terpene Resins
Distributed to the rubber industry by Standard Chemical Co., Akron, Ohio

2 New Compounds for...

PAPER

ARMY-NAVY ORDNANCE WRAP

To meet the rigorous specifications of the joint ARMY-NAVY procurement agency for greaseproof ordnance wrapping paper, General Latex has developed a synthetic latex-base adhesive for laminating cellulose acetate or cellophane to kraft paper.

The most critical features for this adhesive are.

1. *Neutral* (water-extract between 6.5 and 7.5 pH). Ordinary synthetic latex adhesives are alkaline and other commonly used compounds are acid.
2. *No delamination* after: 7 days at 140° F; 112 hours in Fadeometer; 8 days in oxygen bomb.
3. *Cost* per dry pound and on a mileage basis significantly lower than adhesives now in current use for this purpose.

Available either uncolored or dyed red for immediate application.

TEXTILES

QUARTERLINING AND LEATHER SUBSTITUTES

This new synthetic adhesive provides an effective undercoat for lacquer on rubber-impregnated textiles in ladies' shoes and other products requiring a high-grade leather substitute.

It minimizes discoloration of the lacquer and reduces migration of the lacquer plasticizer. Available as an aqueous dispersion ready for use.

A practical approach to the use of synthetic dispersions in your product is to refer your problem to our laboratory. No matter what the process — coating, impregnating, or bonding — our experienced technical staff specializes in compounding the material best suited to your requirements.

GRS latex types, 2, 3 and X-160, normal and concentrated, available from stock.

A Complete Service to Manufacturers

RESEARCH • MATERIALS • ENGINEERING • MANUFACTURE

General Latex & CHEMICAL CORP.

666 MAIN STREET, CAMBRIDGE, MASS.

Agents for Rubber Reserve Company for storage and distribution of natural rubber latex. Distributors for Rubber Reserve Company for synthetic latex. Operators of the Government-owned Baytown, Texas, synthetic rubber plant in collaboration with the General Tire & Rubber Co.

bottles

bags and

barrels

of chemicals used in

rubber

Accelerators	Antioxidants
Ammonia Anhydrous	Piperidine
Ammonia Aqua	Santobrite
Caustic Soda	Santocel
Cyclohexylamine	Sodium Sulfite
Hydrochloric Acid	Plasticizers
Lacquers	"Insoluble Sulfur 60"
Wetting Agents	Sulfuric Acid

For the most part these Monsanto products are available only on priority. Some, however, can be obtained from time to time without priorities. For information on availability, technical information or samples, please contact the Monsanto Rubber Service Department, Second National Building, Akron 8, Ohio. Or, write to MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second St., St. Louis 4, Missouri.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal, Toronto.

Use UBS COMPOUNDS for BACKING, COMBINING, COATING

"and do the Job Better"

● In Combining operations, UBS developed Buna Latex Compounds provide a positive one-coat bond, good flexibility, and excellent moisture resistance and ageing qualities. Outstanding in this field is UBS's Formula CT-456-B, which has been extremely successful on the can drier machine.

● When used for Backing, UBS developed Buna Latex Compounds lock the pile firmly to the fabric base, provide good flexibility and ageing, and withstand dye bath temperatures without deterioration. A variety of thoroughly tested formulas, developed for specific problems, are available.

● When used for Coating, UBS developed Compounds form a tough, flexible, contiguous film. A variety of formulas, based upon Ubatex (an original UBS synthetic), Buna, Neoprene, etc., are available. In most instances, special compounding to meet individual requirements is advisable.

Long-time specialists in the fields of Combining, Coating and Impregnating Compounds, the UBS Laboratories are constantly working with all the latest synthetics (Buna, Neoprene, Vinylite, etc.). Recent UBS developments include formulas for an original synthetic latex and a totally new synthetic rubber.

Write today, describing your Backing, Combining and Coating Problems.

Address all inquiries to the Union Bay State Chemical Company, Rubber Chemicals Division, 50 Harvard Street, Cambridge 42, Massachusetts.

UBS

UNION BAY STATE *Chemical Company*

Serving Industry with Creative Chemistry

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS

With this New Clutch

YOU CAN SAVE

1. Space
2. Maintenance
3. Repair Cost
4. TIME

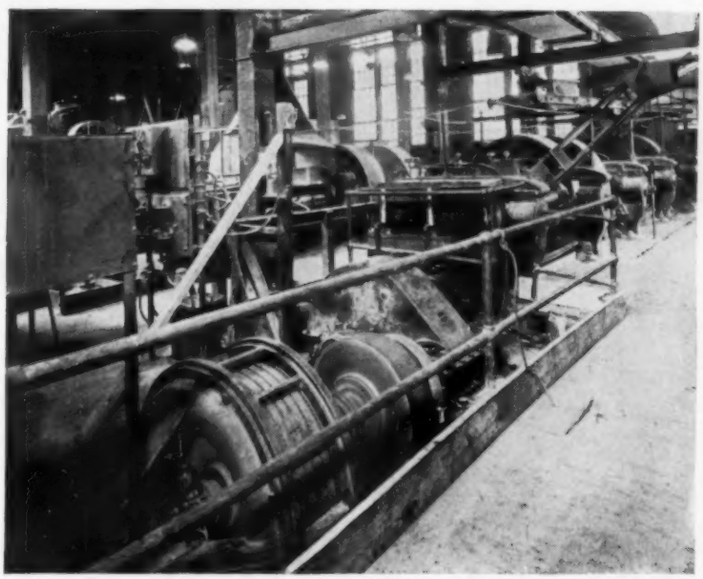
The FAWICK Airflex Clutch

1. Saves Space because it is compact and requires no springs, arms or toggles. It controls power by air.
2. Saves Maintenance because it requires no adjustments, no lubrication. Even corrects automatically for misalignment.
3. Saves Repair Costs because there are no parts to break or wear out. Has torsional flexibility—absorbs shocks and vibration.
4. Saves TIME because it permits dependable *full-time* operation, in the heaviest service.

• • •

The Fawick Airflex Clutch has proved its performance in hundreds of Naval vessels under combat conditions—and for heavy-duty drives throughout industry.

Ask our Engineering Department for recommendations.



Fawick combined Airflex Clutch and Brake for Rubber mills exceeds all minimum safety requirements. Introduces new operating and maintenance economies.

FAWICK AIRFLEX COMPANY, INC. • 9919 Clinton Rd., Cleveland 11, Ohio

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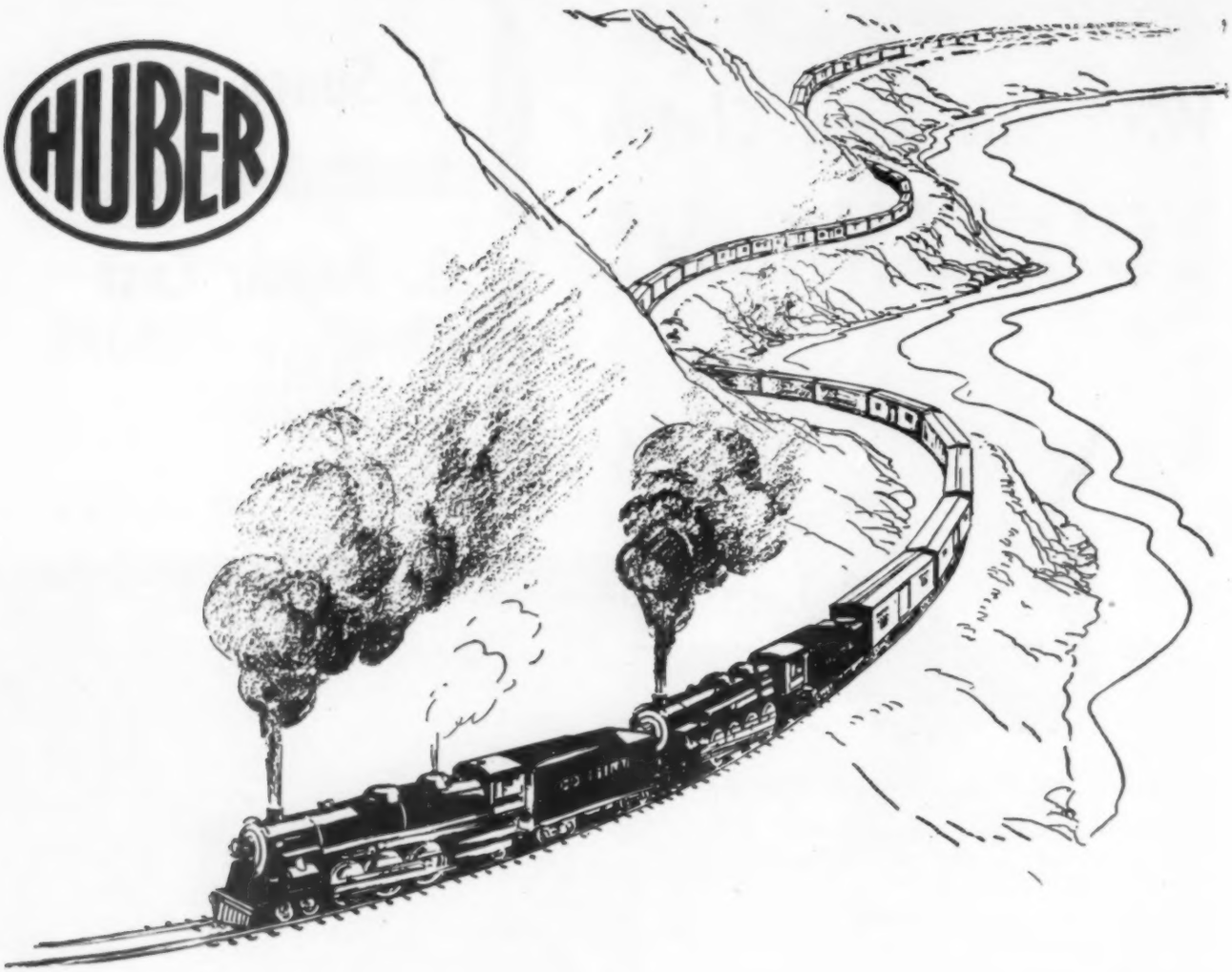
FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

HUBER



MORE SUPREX CLAY COMING!

The sudden and drastic restrictions on the use of carbon blacks have created a heavy new demand for SUPREX . . . the preferred hard clay (reenforcing).

Anticipating this condition six months ago, processing equipment was ordered for a large new SUPREX unit . . . 2000 tons (50 carloads) per month.

It is being rushed to completion, and soon we hope to be able to take care of the still heavier demand which is in prospect.

J. M. HUBER, INC.

460 WEST 34th STREET, NEW YORK, 1, N. Y.

The RUBBER AGE

One of the World's Outstanding Rubber Journals

M. E. LERNER
Editor
LOIS HOPKINS
Production Manager
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Circulation Manager
PETER P. PINTO
General Manager

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Compiled by D. E. Cable, Ph.D.
For Years 1935-1939

LATEX IN INDUSTRY (Out of Print)
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932 to January, 1937; rubber derivatives to January, 1937.

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SPEED · SAFETY · ECONOMY
IN
ACCELERATION FOR WIRE INSULATION
WITH **GR-S**

Naugatuck Chemical offers some practical suggestions for wire insulation compounds cured in "C.V." units. They may also be adapted to pan or reel cures.

(Two Recommendations for Each Type are Given)

CURATIVES			TYPE COMPOUND			
Based On 100 R.H.C.	CODE		PERFORMANCE GRADE		JACKET STOCK	
SULFUR	2.5	2.5	2.5	2.5	2.0	2.0
MBTS	0.75		0.85		1.0	
METHAZATE	0.75		0.85		1.0	
MORFEX 33		2.0		2.0		
BJF						1.5
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The RUBBER AGE

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The Cryptostegia Clipping Method of Rubber Production

By P. J. FAULKS and J. McGAVACK

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AFTER the loss of the Hevea plantations in the Far East, attention was directed towards other plants as a source of rubber. Of these plants *Cryptostegia grandiflora* appeared among the most promising because of its rapid growth, its toleration of widely different climates and soils, and the high quality of its latex rubber.

Cryptostegia is a semi-woody climbing shrub and has not yet been tapped successfully by the methods used for Hevea. Its long sucker shoots or whips can be tapped by daily removal of about one inch of their length and catching the latex which exudes *(1)*. Each shoot can be tapped during a one to two month period, and meanwhile new shoots develop for further tapping. The method requires a large amount of hand labor and mechanization does not appear feasible.

The Principle of the Clipping Method

When a Cryptostegia shoot has been cut and a certain amount of latex has exuded, the latex which remains on the tip coagulates and dries. Further exudation, coagulation and drying result in the formation of a "plug" of rubber on the cut surface.

The idea, therefore, arose and was tried out *(2)* of mechanically clipping the shrub so as to form numerous rubber plugs on the cut ends of shoots, then clipping these plugs off with a short length of stem, repeating this clipping procedure as many times as feasible, and recovering the rubber from the clippings by milling and flotation. Both sucker shoots and normal axillary shoots would be tapped by this method, instead of only the sucker shoots by the hand method.

At the end of this harvest the shrub would be given a rest period during which a new crop of shoots for harvesting would grow from dormant buds. One complete harvest cycle would, therefore, be as shown in the accompanying diagram.

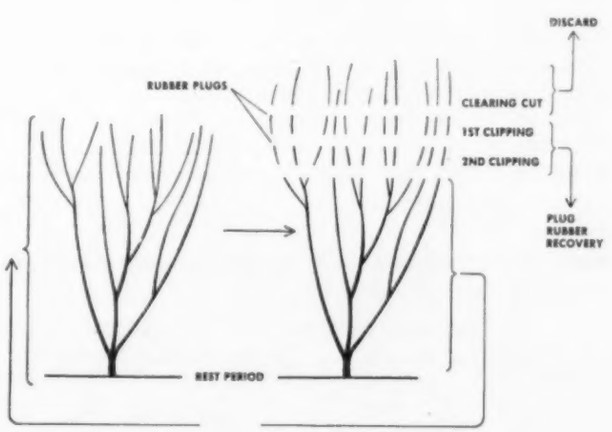


Diagram of a Complete Harvest Cycle.

This is a typical experimental plot of six-month old cryptostegia at Yuma. Because the annual rainfall averages only two inches, irrigation is essential. Normal irrigation for the Yuma area is once or twice a week.

Experimental Evaluation of the Clipping Method

The experimental evaluation of the clipping method was carried out on the United States Rubber Company's Experimental Farm at Yuma, Arizona, and at U. S. Rubber's General Laboratories at Passaic, N. J. It entailed consideration of the culture of Cryptostegia, the system of making clippings, and the recovery of rubber from the clippings.

All operations in this experimental evaluation were made by hand. Clippings were made by bunching the plants up in one hand and then clipping off the appropriate length of shoot with a pair of shears in the other hand. Judgment of heights and lengths was aided by setting a graduated stick in the ground beside each hill.

Culture: The Cryptostegia stands used for the experimental work were grown on irrigated Yuma mesa land. This land is very sandy, and Cryptostegia responds to applications of barnyard manure and to nitrogenous and phosphatic fertilizers. The plants were grown 1 to 4 per hill, with hills spaced 2 feet x 3 feet and 3 feet x 3 feet. It was clear that maximum yields of clippings per acre could not be obtained from these stands, but they were used because no denser stands were available.

Measurements of the area occupied by clipped shrubs indicated that hills planted 1 foot x 1 foot would provide a suitable density for maximum yield per acre. At this density the shade of the shrubs would probably give fair weed control. Hedges of about 8 rows of plants separated by paths made by missing one row were envisaged as suitable for being clipped by a machine built on the same kind of body as that of a lumber truck, so that the wheels would run in the avenues and the body straddle the rows.

Table I—Relation Between Length of Clipping and Percentage Rubber in the Clipping

Length of Clipping	Percentage of Rubber in First Clipping	Percentage of Rubber in Second Clipping
½"	5.00	3.45
¾"	3.90	3.68
1½"	3.05	2.61

Table II—Percentage of Rubber in ½-Inch Clippings

(Date of Harvest: July 20)

Height of Clipping (Inches Above Ground Level)	Fresh Wt. of Clippings (Lbs.)	Dry Wt. of Clippings (Lbs.)	% Rubber in Dried Clippings
24	35.19	...	...
23½	4.31	0.99	4.37
23	3.75	1.00	4.88

Cryptostegia plants have great vitality. They can be cut or burnt to the ground annually, yet new shoots spring up vigorously from the rootstock. Cryptostegia may, therefore, be planted for long-term exploitation; the useful life of a plantation would be determined by the incidence of root disease rather than by senescence of the plants.

No physiological disturbances (*e.g.*, such as the "brown bast" disease of Hevea) were encountered as a result of repeated harvesting, and the clipping wounds did not result in the invasion of the plants by pathogenic organisms.

System of Making Clippings: Observations on the growth of the plants indicated that, under Yuma conditions, plants of an average height of about 27 inches and a main stem diameter of about 0.4 inch just above ground level were suitable for clipping. Such plants were obtained by fall planting (September) and allowing them to grow until June of the following year. Similar growth could be obtained during four months of summer weather.

A height of 16 to 24 inches above ground level at which to make the clippings was suitable. At this height the bushes were short enough to be compact but not so short as to reduce the number of stems available for clipping.

The lengths of shoots removed in a clearing cut vary

Approximately five acres of one-year-old cryptostegia plants at various stages of clipping experiments are seen in this view. The stakes in the foreground act as guides as to the level at which the clipping is made.

greatly because of the rapid growth of the water shoots and the relatively slow growth of the upper axillary shoots. It was found, however, that if the weight of the clearing cut was 30 to 50% of the combined weight of the clearing cut plus the next two clippings, then most of the available shoots were harvested. If the clearing cut is too far down on the stem the clippings are woody and may cause more difficulty in harvesting.

It was observed that plugs of the same approximate size were formed on serial clippings regardless of whether the clippings were ½-inch, 1-inch or 1½ inches long. It was decided therefore to make clippings as near ½ inch long as feasible so as to get the best concentration of recoverable rubber. The relation between length of clipping and percentage rubber therein was determined to be as shown in Table I. A hand clipping (621 hills) in which the clippings were carefully made so as to be ½-inch long gave the result shown in Table II.

In general practice the length of the clippings was about 1-inch because of the difficulty of manipulating the plants. Clippings shorter than ½-inch were not attempted.

It was observed that, under Yuma conditions, plugs on third clippings were much smaller than on first and second clippings and were less suitable for rubber recovery. The harvest cycle was therefore standardized as a clearing cut and two clippings.

It was found that the completion of the harvest in one day (clearing cut in the morning, first clipping at noon, second clipping in the afternoon) gave about the same result as completion of the harvest in three days (clearing cut on first day, first clipping on second day, second clipping on third day). The completion of the harvest in three days was chosen as standard in order to spread the work satisfactorily.

The cryptostegia plants in this view indicate three years growth after nine-year old plants had been cut back.

TABLE III—EXPERIMENTAL HAND-CLIPPING HARVESTING SERIES

Series 1

Date of Harvest (1943)		Attempted Height of Cutting Above Ground Level* (Inches)	Weight of Green Material (Lbs.)	Weight of Dry Material (Lbs.)	Percentage Rubber on the Dry Material
July	22	24	22.38	...	...
	23	23½	4.19	1.06	3.78
	24	23	4.38	1.12	3.54
Aug.	11	24	43.00	...	...
	12	23½	12.75	2.46	3.30
	13	23	11.25	2.39	2.76
Sept.	3	24	69.50	...	...
	4	23½	18.50	3.34	2.98
	5	23	18.31	3.50	2.76
Sept.	16	24	25.25	...	...
	17	23½	13.13	2.64	3.04
	18	23	16.31	3.32	3.16

Series 2

Aug.	18	24	32.25	...	...
	19	23½	10.75	2.10	3.06
	20	23	10.63	2.07	2.45
Sept.	3	24	18.38	...	...
	4	23½	7.50	1.68	2.00
	5	23	10.56	1.68	2.09
Sept.	15	24	34.88	...	...
	16	23½	24.13	4.50	2.89
	17	23	25.38	5.29	2.45
Oct.	4	24	45.50	...	...
	5	23½	20.13	3.80	2.67
	6	23	22.75	4.70	2.82

Note: In Series 1, the seed was planted in September, 1942; hills were 2' x 3' apart, with 1 to 4 plants per hill; 463 hills were clipped. In Series 2, the seed was planted in June, 1942; hills were 3' x 3' apart, with 1 to 4 plants per hill; 696 hills were clipped; the plants were cut back to 6" above ground level in March, 1943, to force new compact shoots for clipping. In both series, clippings were analyzed by extraction with acetone followed by extraction with benzene.

* The clippings were about 1 inch long on the average.

The duration of rest period between harvests for growth of new shoots varied with the season of the year. Under Yuma conditions during the best growing season a period of about 10 days was sufficient. Part of two experimental harvesting series are shown in Table III to illustrate the system of making clippings.

A slight rise in the height above ground at which clipping can take place occurs during the growing season in order to avoid clipping woody stubs left from previous harvests. It is therefore necessary to cut the bush down from time to time and to let it regenerate. Under Yuma conditions Cryptostegia makes little or no growth from November through February, and consequently the bushes can be conveniently cut back in the fall. Vigorous shooting occurs in the following spring. It was found satisfactory to cut the bushes back to a height of 7 to 14 inches above ground level.

Recovery of Rubber: The dry clippings contain 1.5 to 4.5% total rubber and 0.5 to 3.5% is recoverable plug rubber. The rubber can be further concentrated by one of the following schemes:

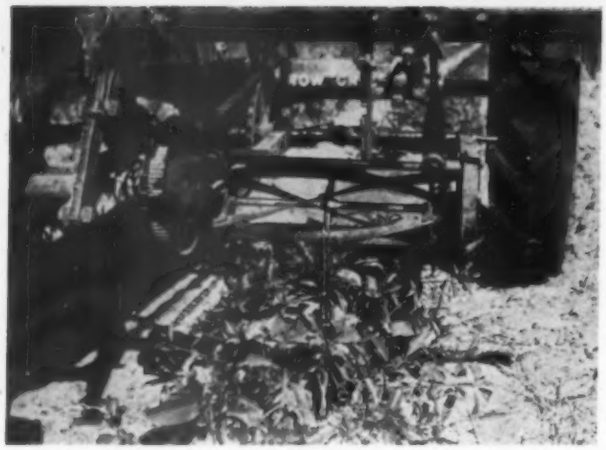
SCHEME (1)

Ensile and/or cook with acid, *e.g.*, 2% sulfuric acid, and/or cook with alkali, *e.g.*, 2% caustic soda.

Wash out the solubilized constituents if considered necessary.

Screen to remove fine plant debris.

Pebble mill the resulting material and float out the liberated plugs in a large volume of water.



The early clipping machine used at Yuma, Arizona, consisted of an ordinary lawn mower driven by a tractor.

SCHEME (2)

Reduce the dry clippings to fine condition by means of a hammer or Wiley mill.

Treat the resulting material so as to cause the rubber to float and the debris to sink in a water bath, *e.g.*, use a wetting agent in the bath; apply a vacuum in order to water-log the debris. This method was used in Haiti to recover plug rubber from whips.

The scheme adopted on point of expediency was ensiling, screening, pebble milling, and flotation.

The ensiling was carried out in Mason jars. Approximately 1 lb. of green clippings was packed in a 1 qt. jar and covered with water. The cap was loosely screwed on, and the clippings were allowed to ferment with the natural organisms present. After about one week the water was changed and this was found to bring about a greater concentration of the rubber. The action was complete in about one month after the original filling of the jar.

The contents of the jar were then suspended in 1 to 2 gallons of water and beaten for 10 minutes with a Mixmaster household stirrer. The resulting suspension was filtered through cheese cloth. This removed almost all the soluble substances and one third of the insoluble substances as fine particles. The rubber plugs were not freed in this operation because they were anchored to the stems by minute threads of rubber (the coagulated contents of the latex tubes).

The filter cake was then transferred to a 1 gallon pebble mill, and water added to bring total solids percentage to 10 to 15. The mill was then rotated until the plugs were free and the plant material finely ground (½ to 2 hours). The contents of the mill were then diluted in a 5-gallon pan of water and the floating rubber transferred to a flask by suction.

Side view of the improved clipping machine built for cryptostegia at Yuma, Arizona. Note the collecting prongs at the bottom right of the machine and the relatively large circumference of the revolving blades.

Development of the Clipping Method

Technical Aspect

Culture: No development was done on culture of Cryptostegia because this would have necessitated destruction of existing stands and delay in the development of machine clipping. This phase of the work was being carried out elsewhere. Stands of the same nature as used for the experimental evaluation were also used in development work.

Machine Clipping: A clipping machine attached to and driven by an Oliver tractor was made. The machine consisted essentially of a reel and stationary blade as in a lawn mower. A lawn mower reel was first used but it was found advantageous to replace this with a longer reel of greater diameter. The reel was 18 inches long and 14 inches in diameter, and it had six blades. It was rotated at about 450 r.p.m. while the tractor moved forward at 2 m.p.h.

A toothed guide led the shoots to the stationary blade. The teeth were about 7 inches long, set ¾s of an inch apart, and turned down so as to lift up the stems as the teeth moved forward. The clippings were thrown back from the reel and collected in a box.

The placing of the stationary blade 1½ inches behind a vertical plane passing through the axis of the reel resulted in the production of more cleanly cut,

TABLE IV—MACHINE CLIPPING HARVESTING SERIES

Date of Harvest (1943)	Height of Cutting Above Ground Level (Inches)	Wt. of Green Material Cut (Lbs.)
April 17	16	99.0
18	15½	41.1
19	15	63.6
May 3	16½	145.6
4	16	72.5
5	15½	92.0
May 17	16½	181.1
18	16	82.0
19	15½	108.6
May 29	16½	154.5
30	16	73.9
31	15½	85.3
June 12	16½	140.3
13	16	82.8
14	15½	79.3

Note: Seed was planted in September, 1942. Hills were 2' x 3' apart, with 1 to 4 plants per hill. The area harvested was 2½ acres. Some of the young plants were lost by sandstorm; this resulted in about 40% empty hills. Plants were cut down to 14 inches above ground level in February, 1944, to force young shoots for clipping.

TABLE V—EFFECT OF PRESERVATIVES ON SHELF-AGING OF CLIPPING RUBBER

Condition of Rubber at End of 2 Months Period	Preservative
Most dry and rubbery	Tonox
	Tonox + JZF
	Control
	Agerite White, Albason, VGB, MNF, JZF, Hydroquinone
	BLE, Neozone
Most sticky and soft	Flectol H

TABLE VI—COMPOSITION OF SCRUBBED, DRIED CLIPPING RUBBER

Rubber hydrocarbon (by chromic acid oxidation)	74%
Acetone extract	17–23%
Substances insoluble in acetone and toluene	3–7%
Ash	0.4%
Nitrogen	0.04%
Cu	0.003%
Mn	0.0002%
Fe	0.03%

shorter, and more uniform clippings. It is believed that a stronger machine with a better designed reel would allow the tractor speed to be increased.

A part of a machine clipping harvesting series is given for illustration in Table IV.

Bulk Ensilage: The machine clippings were ensiled in the first developmental work in 50-gallon barrels. Later a 1000-gallon concrete water tank was used and proved very suitable.

Screening: It was proposed to use a vibrating screen to separate water solubles and fine debris from the ensilage. A vibrating screen was not available, but observations on the action of a vibrating screen on Cryptostegia leaf ensilage at the U.S.D.A. Eastern Regional Research Laboratory indicated that it would be completely suitable and give a better separation than that obtained by the stirring technique.

Pebble Milling: The bulk ensilage was milled in a 25-gallon pebble mill. The mill was run at 40 r.p.m. and the charge consisted of 50 to 75 pounds of wet ensilage with 10 to 15% insoluble material (dry weight). The resulting slurry was diluted and run slowly into the center of a 50-gallon tank of water kept in a swirling motion. The plugs floated and the debris sank to the bottom and was siphoned off. The indications from this were that the slurry could be handled in thickening tanks in just the same way as guayule slurries are handled. The plugs were removed from the surface by suction.

Purification of the rubber: The plugs were purified by scrubbing with 2% soap solution in a 1-gallon mill for 1 to 2 hours, followed by reflotation to remove the soap and liberated debris.

Some samples of rubber were deresinified by acetone extraction. Deresinification by the use of the apparatus and methods developed for guayule (aerobic bacterial treatment, treatment with alcoholic potash) should be applicable to Cryptostegia rubber plugs, but the methods were not tried.

Partial removal of some harmful metals by boiling the plugs with 1% sulfuric acid or 1% Calgon solution was accomplished. The sulfuric acid tended to make the rubber sticky. Copper content of the rubber was unchanged by treatment, but iron and manganese contents were reduced to less than half of the original.

Preservation of the Rubber: The preservatives were added to the rubber as acetone solutions. The solutions were allowed to dry and the rubber was then given six passes through the mill so as to produce a well-mixed thin sheet. 0.5% of preservative on the weight of the rubber was used throughout. Table V shows the effect of preservatives on shelf-aging of clipping rubber.

On the results of this experiment 0.5 to 1.0% of Tonox (calculated on the rubber dry weight) was added as an acetone solution to the wet worms after scrubbing, and the rubber was subsequently dried and sheeted

Composition and Properties of the Rubber: The freshly separated and washed plug rubber was whitish and firm; on drying it turned brown. The composition of dried sheet rubber obtained by scrubbing the separated plugs in soap solution, washing and drying, was as shown in Table VI.

As an example, samples of two rubbers (ATT obtained by soap scrubbing alone, ATU obtained by sulfuric acid treatment plus soap scrubbing) were compounded, mixed, vulcanized and tested as shown in Table VII. Part of each rubber was deresinated with acetone before compounding, thus producing four kinds of rubber for compounding. Each of these was

Latex occurs in the leaves, twigs and stems of the cryptostegia plant. When a leaf is broken the latex oozes out and forms into drops.

TABLE VII—VULCANIZATION OF CRYPTOSTEGIA GRANDIFLORA SHORT-SHOOT CLIPPING RUBBER

Code of crude rubber		ATT	ATU	ATT	ATU	ATT	ATU	ATT	ATU
Rubber acetone—extracted		No	No	Yes	Yes	No	No	Yes	Yes
A.E. of crude		23.16	22.72	2.10	2.59	23.16	22.72	5.29	2.02
Code of compound		ATV	ATW	ATZ	AUA	AUL	AUM	AUN	AUO
Rubber		100	100	100	100	100	100	100	100
Zinc oxide		6	6	6	6	40	40	40	40
Stearic acid		5	5	5	5	5	5	5	5
JZF		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Captax		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
DPG		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sulfur		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Temp. of Vulc. (°F.)		260	260	260	260	260	260	260	260
Compounded on total wt. or on rubber		TW	TW	TW	TW	Rub.	Rub.	TW	TW
Sponginess in Vulc. slab		No	Sl.	No	Sl.	No	Yes	No	No
Air bubbles in Vulc. slab		No	Sl.	No	Sl.	One 30′	No	No	No
Cracks in tensile strips		No	No	No	No	No	45′	Sl. 45′	Yes
Mod. 200%	15′	....	....	....	....	67	....	....	....
	30	211	149	226	189	167	136	218	296
	45	....	....	....	....	167	154	228	....
Mod. 400%	15′	....	....	....	....	167	....	....	....
	30	508	356	595	486	449	350	536	844
	45	....	....	....	....	444	455	670	....
Mod. 600%	15′	....	....	....	....	400	....	....	....
	30	1500	....	1900	....	1600	1200	2000	....
	45	....	....	....	....	1500	....	....	....
Tens. (psi)	15′	....	....	....	....	2500	....	....	....
	30′	1900	1400	2900	1600	2400	1900	3100	1800
	45	....	....	....	....	2700	1200	1300	....
% Elongation	15′	....	....	....	....	930	....	....	....
	30	630	580	660	580	670	670	690	510
	45	....	....	....	....	670	570	550	....
T-50	15′	....	....	....	....	—4.9	....	....	....
	30	—19.2	—18.3	—22.7	—23.2	—19.6	—18.2	—20.6	—5.5
	45	....	....	....	....	—19.8	—21.3	—26.4	....
Tens. aged (48 Hrs. O_2)	15′	....	....	....	....	....	....	....	....
	30	611	669	1800	2400	1600	....	....	....
	45	....	....	....	....	....	....	....	....
Set (green)	15′	....	....	....	....	.43	....	....	....
	30	.29	.24	.29	.17	.31	.45	.44	.31
	45	....	....	....	....	.46	.27	.22	....

compounded as a pure gum and as a high zinc carcass stock. Black stocks were not investigated.

The deresinated samples behaved much more satisfactorily on the mill. The resiniferous samples became too soft and tacky for easy handling even on a very cold mill. However, where there was a larger amount of rubber available, as in AUL, in particular, handling was easier. It is true, therefore, that the small amount of sample was one definite factor in the difficult mixing of ATV, ATW, and AUM.

The data in Table VII suggest the following comments:

1. Deresination improves gum stocks and high zinc oxide stocks, but high zinc oxide stocks with resiniferous rubber may be nearly as good as with deresinated rubber.

2. Green tensiles of ATT rubber are superior to those of ATU rubber, and tensiles of deresinated rubber are superior to those of resiniferous rubber.

3. In particular, deresinated ATT gave a gum tensile of 2900 psi and a carcass stock tensile of 3100 psi. In the same carcass stock resiniferous ATT gave 2700 psi tensile.

Economic Aspect

It is difficult to calculate a cost for the clipping rubber on the basis of the small scale work completed to date. The cost per pound of rubber for pebble milling and the flotation, scrubbing, and purification of the rubber may possibly be about the same as that for guayule, which is in economic production.

Ensiling in large bulk would be relatively cheap.

The culture of the shrub is simple. Growth is rapid and clipping may begin in a suitable climate at four to six months after planting.

The plantings on which the work in this report is based are not suitable for calculation of yield of rubber per acre due to density and climate but may be used for making fair estimates. It would be desirable to grow the shrub in a climate in which vegetative growth is vigorous throughout the year; there is little or no growth from November through February at Yuma. The harvest cycle at Yuma during the summer was about two weeks; therefore in a suitable climate 25 cycles per annum should be possible. With the optimum number of plants per acre the yield of clip-

pings per acre per cycle would probably be 5 to 10 times that obtained at Yuma.

The yield of rubber per acre per harvest cycle is determined by the age of the plants and the season; at Yuma the yields per acre varied between 0.4 lbs. and 1.8 lbs. rubber per acre per cycle.

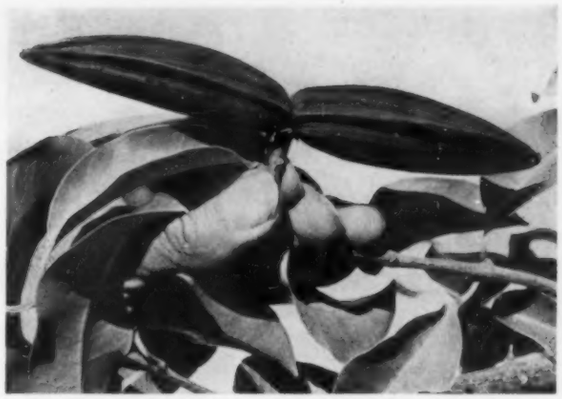
Using these figures the yield of rubber per acre per annum expected under moderately good growing conditions would be between 25 x 5 x 0.4=50 lbs. per acre and 25 x 10 x 1.8=450 lbs. per acre. A reasonable mean yield would probably be 25 x 7.5 x 1.1= 206 lbs. per acre.

Summary

The production of rubber from the laticiferous shrub, Cryptostegia, by a clipping method is described. This method consists of the formation of plugs of rubber on the ends of cut shoots and the clipping off of these plugs with a short length of shoot. The plugs can then be recovered from the clippings by, for example, ensiling followed by pebble milling and flotation. The rubber is of fair quality and the data indicate that it might be quite economically produced in a suitable climate.

ACKNOWLEDGMENT

The authors wish to acknowledge gratefully the help obtained from R. E. Beckett of Yuma, Arizona, and C. E. Rhines, C. E. Linscott, J. W. Haefele, F. W. West and J. A. Wagner of the General Development Department of the U. S. Rubber Co., in carrying out the program on Cryptostegia as outlined above.



Close-up of the double seed pod which is characteristic of cryptostegia. This pod is from a six-month old plant and measures from 5½ to 6 inches from tip to tip and contains from 600 to 800 seeds.

REFERENCES

(1) This method has been worked out by the Société Haitiano-Américaine de Développement Agricole in Haiti.

(2) Concentration of rubber in this manner is covered by U. S. Patents Nos. 2,353,460 and 2,353,482.

Insulac W—A Specially-Treated Gilsonite

COMPOUNDERS have known for years that gilsonite when incorporated in rubber compounds acted as a reinforcing agent and in addition to enhancing the physical properties of the vulcanizate gave excellent electrical properties, including high insulation resistance, low capacity and low power factor. However, gilsonite, even in the powdered form, is difficult to disperse in either natural or synthetic rubber, and in its natural form may contain small pebbles, sand, etc., from the mining operation which is bound to cause trouble in processing and imperfections in the finished product.

Insulac W, a specially-treated gilsonite recently introduced by the Caldwell Co., First Central Tower, Akron 8, Ohio, was designed to overcome these difficulties. Made from natural gilsonite, the impurities are first removed and the purified gilsonite is then so treated as to insure ease of dispersibility in Banbury or mill-mixing of GR-S compounds. The following information on the new material was furnished by its suppliers:

In the simple unpigmented compound given below a tensile of 1100 pounds and an elongation of 650% were obtained at the optimum cure:

GR-S	100.00
Zinc Oxide	5.00
Insulac W	35.00
Sulfur	1.75
Santocure	1.50

With loadings of other reinforcing pigments Insulac W tends to enhance the tensile and elongation characteristics of the vulcanizates although the effective loadings of Insulac W should be decreased as the maximum loadings of the other pigments are approached. For example: With a channel black loading of 45 parts on 100 parts of GR-S the maximum loading of Insulac W would be about 10 parts.

Introduced early in the mixing schedule Insulac W assists in the dispersion of most pigments. In many compounds it increases ease of extrusion and calendering. With rather high loadings of channel black it tends to decrease the modulus while it increases the tensile and elongation.

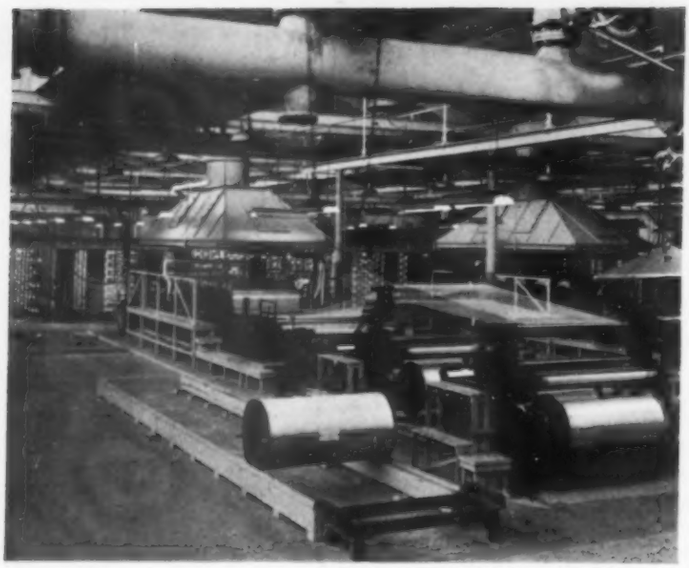
Insulac W is adapted to the insulated wire industry due to its reinforcing properties and the excellent electrical characteristics imparted to the insulation. It increases insulation resistance, decreases moisture absorption, capacity, and power factor, and gives higher breakdown voltage.

The specific gravity of Insulac W is 1.06 and its melting point is 260° F. In general, it has practically no effect upon cure although it may accelerate or retard to a slight extent depending upon the acceleration used as well as the nature of some of the other pigments.

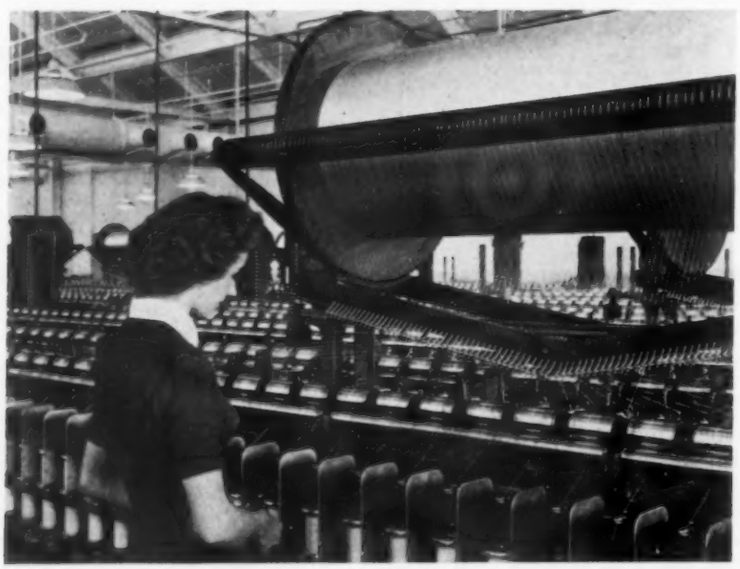
An Index to Volume 56 of RUBBER AGE will be found on Pages 125 to 128 of this issue.

MANUFACTURE OF

at Parkersburg, W. Va., Plant

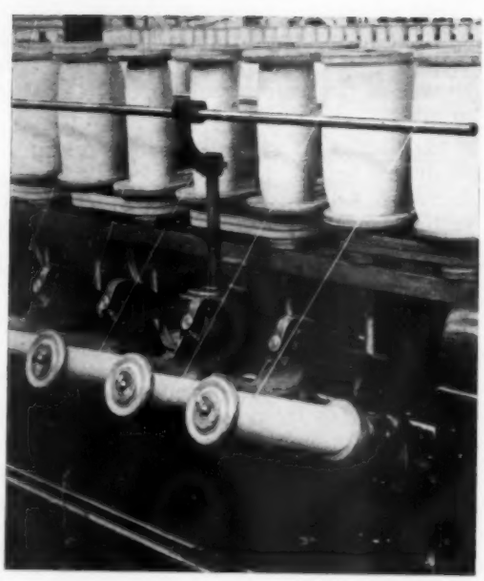


Slashing (left): The purpose of the slashing operation is to stretch the yarn, thereby reducing its elongation and increasing its strength. This operation also impregnates the yarn with a finish which facilitates later operations and helps in making the finished fabric more absorbent to the subsequent rubber treatments.



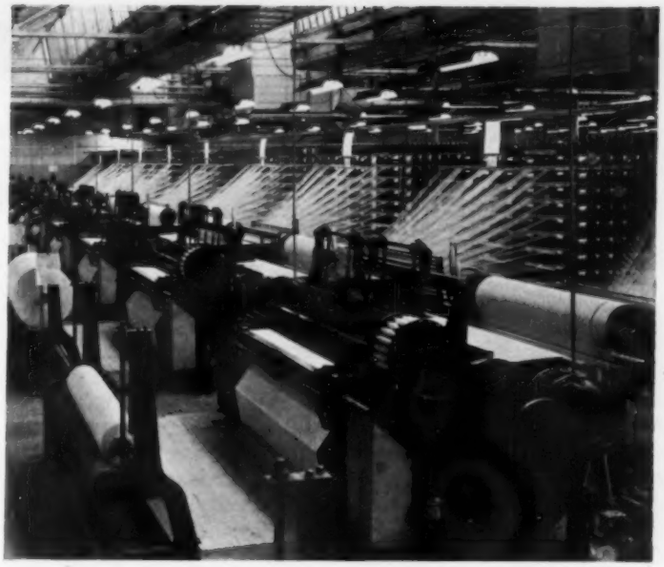
Single Twisting (above): The slashed beam is placed in position on the single twister frame as shown. Here twist is imparted to each of the single ends of yarn as they are rolled from the beam. Twisting makes the yarn more resistant to flexing strains.

Spooling (right): The twisted yarn from the single twisters is taken to these spooling machines and four small bobbins are wound on to one spool, thus producing a large package for the supply creel on the cable twister. This method has been found more economical for the creeling operation.

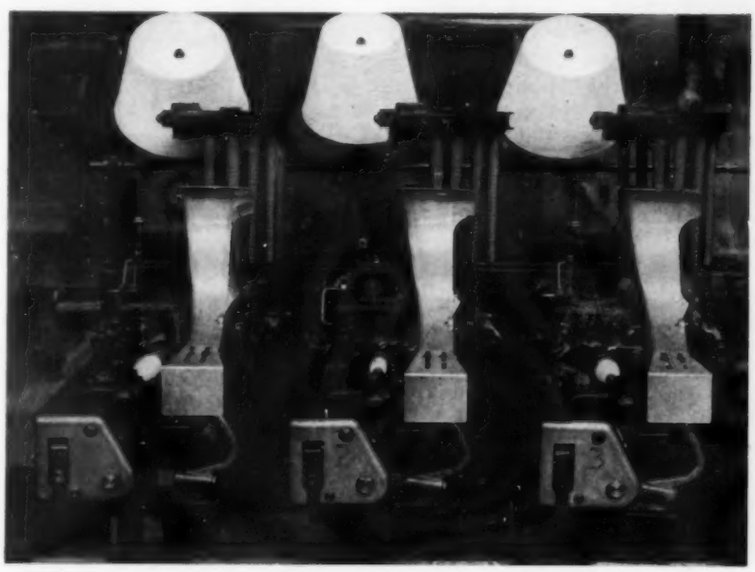


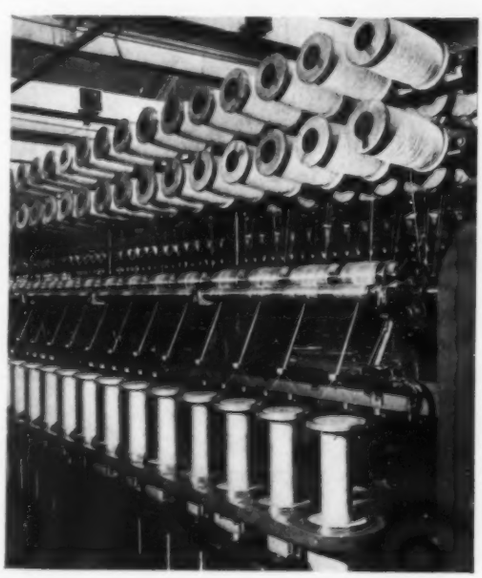
RAYON TIRE FABRICS

of the American Viscose Corp.



Cable Twisting (right): Two spools from the spooling machine are creeled up on the cable twister for each twisting bobbin on the frame. The ends are drawn down through the feed rolls, through the guide, through the traveler, and around the bobbin. The resulting tire cord is later woven to fabric.





Filling Winding (above): The filling used in weaving tire fabric is of cotton and about the same size of 150 denier filament yarn. The filling yarn is wound on cops, or slender headless bobbins, by an automatic copping machine, as seen in this photograph.

Weaving (left): In the weaving of tire cord into fabric the parallel strands or cords are drawn out to form a sheet and bound lightly into position by cross or filling thread so that the parallel strands will not become displaced and overlap each other when being treated and handled by the tire manufacturer.

Principal Limitations of Dielectric Heating

By CARL J. MADSEN

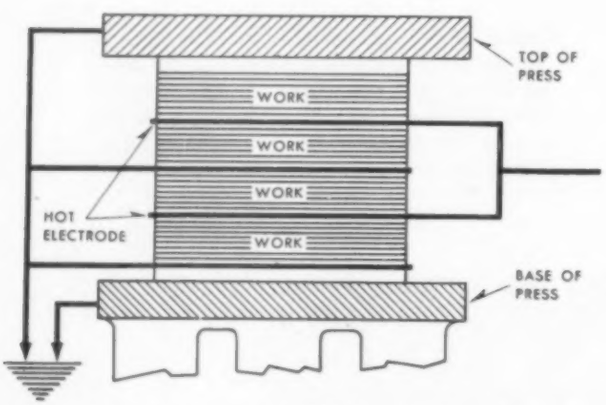
Electronics Engineer, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania

The application of high-frequency heating in industry, including the rubber and plastics fields, is steadily increasing. Some major developments have already been recorded and others will be revealed as and when censorship permits. It must be realized, however, that not all manufacturing processes lend themselves to the relatively new heating method, and universal application has not yet been realized. The accompanying article reviews the major limitations of dielectric heating which prevent universal application.—Editor.

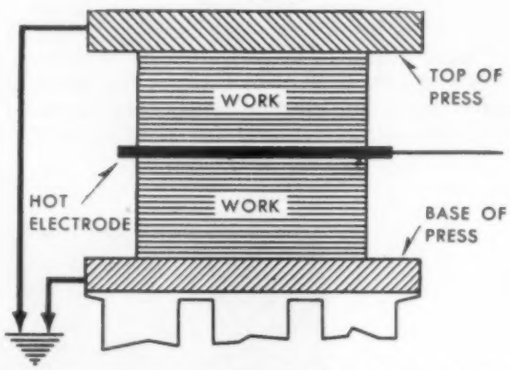
A NUMBER of economically attractive applications of high frequency heating are found in the rubber industry. Among these applications are the drying of special products or samples, heating of preforms of rubber compounds in molding, and supplying heat in certain cycle-welding applications. Undoubtedly many applications exist and will materialize as the field is explored.

High frequency heating is divided into two main types, induction and dielectric heating. Induction heating technique is applied to materials classed generally as conductors of electrical current, and employs a varying electro-magnetic field. Dielectric heating technique is applied to materials classed generally as non-conductors or insulators, and employs a varying electric field.

In dielectric heating, the material (to be heated) is commonly placed between two uniformly spaced plates



Dielectric heat can be applied to heating presses by connecting the electrodes in various ways. This "sandwich" method of heating shows how four laminated assemblies can be heated at one time. The top and bottom of the press and the center element are kept at ground potential.



Dielectric heating is accomplished by subjecting the work to a high-frequency field between two metallic surfaces having a relatively high difference of potential between them.

or electrodes, thus forming the dielectric of a condenser. The electrodes are connected to a source of high frequency energy. Frequencies above 2 megacycles (2,000,000 cycles per sec.) are commonly used, being supplied by electronic generators or oscillators.

With the popularity of high-frequency heating growing by leaps and bounds, it is desirable to stop for a moment now and then to take stock of the state of the art. This can best be done by breaking down the broad view and reviewing only a narrow phase at a time. This paper is concerned with only dielectric heating and reviews the major limitations that prevent universal application. In considering these limitations, it must be understood that almost all of them are interlocked, to some degree with each other. Hence, in discussing each individually it is well to remember these inter-relations when considering an actual application.

Cost

High frequency energy is not a cheap source of heat. In terms of dollars per KWH, it will cost approximately $0.025 to $0.04 including direct operating cost, maintenance and amortization. It becomes economical by virtue of one or more of these factors:

1. It produces a result not possible by other methods of heating.
2. It increases the speed of a process and saves labor and/or overall equipment cost.
3. It produces or confines the heating in the part or point where needed, thus reducing overall power consumption.
4. It is clean and compact.

5. It reduces rejects, or improves the production quality of a product.

6. It is flexible in its application to a variety of operations, processes or products.

These factors are often of sufficient importance to make an application economically attractive.

Material

Dielectric heating is applicable only to materials normally considered poor conductors of electricity or insulators. When the electrical resistivity of a material drops below 1000 ohm-cm, it is usually possible or necessary to use some technique other than dielectric heating. The state and characteristics of the material have considerable influence on the division point, changing it as much as 10 to 1.

A convenient formula for calculating the heating in dielectric materials is given by:

$$W = \frac{1.41\ A\ f\ E^2\ e'' \times 10^{-12}}{d} \qquad (1)$$

where W = rate of heating in watts
A = area of electrode in square inches
d = thickness of material in inches
f = frequency in cycles per second
E = voltage RMS
e'' = loss factor of material = e' tanδ

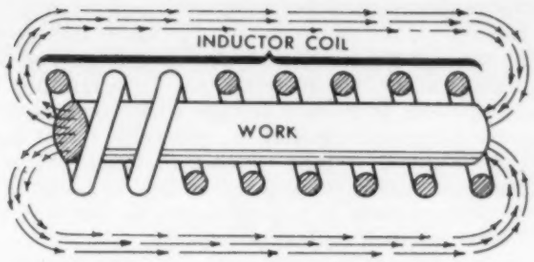
The following paragraphs discuss briefly each of these factors.

Dimensions: The dimensions of the piece of dielectric material are important in that they may influence an application as to frequency, rate of production or electrode design. In general, dielectric heating becomes attractive when the thickness of the material is sufficient to make it difficult to heat the material throughout by conventional means. In terms of inches, this will vary with the thermal conductivity of the material.

The thickness of the material must be reasonably uniform if uniform heating is desired. If the work is of such shape (for example, wedge shaped), that two pieces of material can be placed in complementary positions and the resultant thickness be uniform, the material will heat evenly. Special technique in electrode design and arrangement may sometimes be used when dealing with irregular thickness materials. The relation of thickness and voltage will be discussed under voltage.

The area of material to be heated will limit the frequency which may be used in two ways: (1) The capacitive reactance of a large area may become sufficiently low as to make tuning of the load extremely difficult if not impossible and the currents involved may also reach magnitudes difficult to handle; and (2) The length of the load may be such as to produce standing waves. This will be discussed further under frequency limitations.

Sometimes it is possible to scan the material, thus reducing the electrode area to a value which permits convenient adjustments and frequencies sufficiently high to produce desired rate of heating. Occasional applications are encountered where a particular area can be heated if the material is stacked, increasing the thickness dimension and thereby reducing the capacity of the load.



Induction heating is accomplished by converting electrical energy into heat by arranging the work so that it is in the magnetic field created by high-frequency current through an induction coil.

Frequency: In general (since the amount of energy introduced into the material is proportional to frequency) the desire is to use as high a frequency as possible. A compromise is usually necessary however, due to one or more limitations. The effect of large areas and low capacitive reactance was discussed previously.

The length of the material may be such as to produce uneven heating due to standing wave effect. The higher the frequency used, the greater the probability of unequal voltage distribution over a given length or area. If the longest dimension of the electrodes is a small fraction of a wave length, or if the material is scanned, this effect is minimized. Ordinarily if the longest distance from the point of connection to the edge or corner of the high voltage electrode is less than 1/16 of a wave length, very little trouble will be experienced. Heating will be sufficiently uniform to produce a variation of less than 20 per cent over the area involved. In some processes this may be intolerable, restricting the maximum frequency (or maximum dimensions of the work) to a still lower value.

The *maximum* frequency which can be used without exceeding the above variation in heating can be determined from the formula:

$$f = \frac{62.5}{l\ \sqrt{e'}} \qquad (2)$$

where f = frequency in megacycles
l = maximum distance from point of connection to edge or corner of high voltage electrode in feet.
e' = dielectric constant of material (specific inductive capacity)

Another limitation occasionally encountered is that of generator design for high power at high frequencies. From a practical viewpoint at the moment it appears undesirable to use frequencies above 20 megacycles when powers above about 20 KW are involved.

Voltage: The power input to the material is proportional to the voltage squared. Hence, if the voltage is increased sufficiently, considerable power can be supplied to the work at relatively low frequencies. Two factors limit the voltage which may be applied.

The total voltage between electrodes should be kept under 15,000 volts. It is not impossible to use voltages above this value, but the additional precautions necessary to avoid corona and arc-overs are often more

expensive than some other compromise of the engineering factors.

The voltage gradient, that is, the voltage per inch, permissible across the material may be a limiting factor. The radio frequency voltage which will puncture a given dielectric material is generally much lower than the 60 cycle voltage which a material will stand. It appears desirable to keep the voltage gradient below 2000 volts per inch in porous materials and less than 5000 volts per inch on less porous.

Another type of voltage limitation may be reached in some applications where it is impossible to have the electrodes in contact with the material. This gives rise to a condition in which the space between the electrodes is occupied by two materials of widely different dielectric constants. The potential distribution in this case may be such as to cause a breakdown of the surrounding medium (usually air).

Loss Factor: This is a term commonly used to express the degree to which materials will absorb energy by dielectric heating technique. It is easily measured by means of proper equipment. Referring to equation (1), it is obvious that as the loss factor approaches zero, it becomes increasingly difficult to transfer power into the material. A practical lower limit in the loss factor, of materials which can be heated effectively, appears to be between 0.005 and 0.01. Pure polystyrene, quartz and certain other loss materials have loss factors considerably below this value and are exceedingly difficult to heat by dielectric methods.

The upper limit probably blends into the range where the material becomes sufficiently conductive as to respond to inductive fields, although some skin effect will probably be noted before this limit is reached.

Electrodes

A whole treatise could be written on electrode design. One point I wish to cover in this discussion is the fact that heat is not generated in the electrodes to any appreciable degree by the dielectric heating process. The electrodes may be heated by heat transfer from the dielectric material being processed. Often this is undesirable due to the temperature reduction of the adjacent material and may become a limiting factor in some processes. Various simple methods are in common use to minimize this effect.

Summary

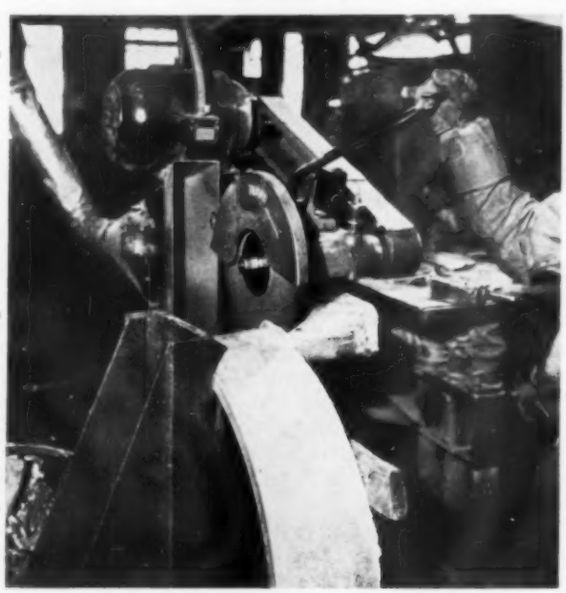
Dielectric heating is a very useful tool in industry, one which is finding new applications every day. However, as with any tool, there are certain limitations which prevent its promiscuous application to all types of problems. By realizing these limitations, and the series of compromises often necessary, a careful analysis will permit the average electrical engineer to apply it intelligently to the specific type of work which it can do well.

Hycar Proves Good Replacement as Abrasive Wheel Bond

THAT synthetic rubber has proved itself an excellent replacement for natural rubber as a bonding agent in the manufacture of abrasive wheels is indicated in recent reports made to the Hycar Chemical Co., Akron, Ohio. These reports establish the fact that special-purpose synthetic rubbers have been developed which permit the manufacture of fast-cutting, long-lasting abrasive wheels for the metal working trades. One report said that a single wheel—and there are thousands of them in use in manpower-short foundries—will do the work of 15 metal bandsaws on cutting off gates and risers on non-ferrous castings.

Results of tests conducted by the abrasive division of the West Co., Inc., were reported to Hycar as follows: Manganese bronze castings were cut with a natural rubber-bonded wheel making 50 cuts for a total of 562½ square inches. A Hycar-bonded wheel on the same work made 99 cuts for a total of 1,013¼ inches, practically doubling the output. Each wheel was 16 inches in diameter by ⅛-inch thick, operating at 16,000 surface feet per minute, 3800 revolutions per minute spindle speed.

The same company's test on aluminum bronze castings were to take 10 cuts each with a natural rubber wheel and the synthetic rubber wheel. Results reported were that the wheel bonded with Hycar cut 141 square inches and that the wear was .43 square inches per square inch of metal cut in comparison with the natural rubber-bonded wheel which cut 112 square inches and showed a wear of .627 square inches per square inch cut. The accompanying photograph shows a West abrasive wheel cutting a non-ferrous casting.



Tests on cutting risers and gates in a foundry show synthetic rubber bonded abrasive wheels are faster and more durable than those bonded with natural rubber.

A. Schrader's Son Completes Its First One Hundred Years

THIS year, A. Schrader's Son, one of the leading manufacturers of pneumatic valves for the rubber, automotive and aviation industries, begins its second century, and joins that circle of enterprises which have survived the hazards of business in ten decades of rapid growth and epochal change.

One hundred years ago, young August Schrader, a skilled mechanic, set himself up a little shop at 115 John Street, Manhattan, as a "turner and finisher of brass." Those were days of rapid growth and innovations—transatlantic steamship service had recently been instituted, Samuel Morse was perfecting the telegraph, and steam heating was being introduced. New York City extended north all the way to Twenty-third Street, and some of the buildings on Broadway had attained the perilous height of six stories.

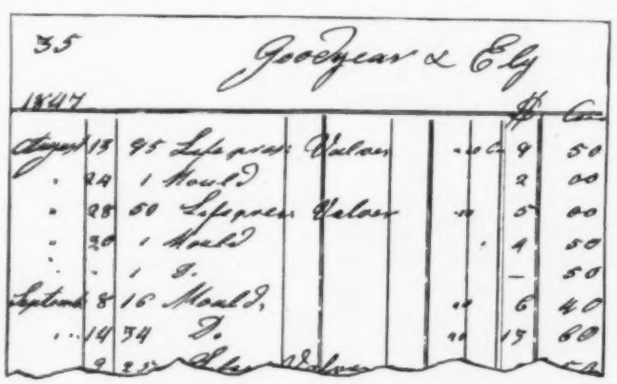
Development of Diving Helmets

An underwater race between divers, off the Battery in lower Manhattan in the 1840's, was of considerable interest to August Schrader from the standpoint of the equipment used. He returned to his shop convinced that he could improve the design and manufacture of diving helmets. His "helms" were a success, and it was not long before the young mechanic turned his attention to the manufacture of air pumps. As a result, he was honored with a diploma at the Industrial Fair of 1856 for an "air pump attached to diver's dress, well manufactured and powerful." From this time on, the Schrader name was increasingly identified with diving apparatus; with approval at home, came acceptance abroad.

Twice in our national history the Schrader organization has been called on by the United States Government for emergency aid. On February 15, 1898, when the battleship Maine was blown up at Havana, the company was immediately asked to furnish diving equipment for the inspection of the ship. Realizing the urgency of the request, Schrader employees kept on the job for thirty-six straight hours—and the equipment left the plant well ahead of schedule. Again, on December 8, 1941, following the attack on Pearl Harbor, Schrader was called upon by the United States Navy to fill a hurried call for diving equipment. It was a matter of hours before Schrader diving and salvage equipment was delivered to the Navy and on its way to Hawaii by plane.

August Schrader

who founded the Schrader firm in 1844 and remained as its guiding hand until his death in 1892.



35 Goodyear & Ely

1847

August	13	95 Lbs. [illegible] Valves		9	50
"	24	1 Mould		2	00
"	28	50 Lbs. [illegible] Valves		5	00
"	30	1 Mould		4	50
"	"	1 D.		—	50
September	8	16 Mould,		6	40
"	14	34 D.		13	60
	9	[illegible]			

Page from August Schrader's 1847 ledger containing entries for work on molds for Goodyear and Ely. The "Goodyear" part was the immortal Charles Goodyear, discoverer of vulcanization.

Role of Diving Equipment in War

Most of the diving equipment now in use throughout the world is Schrader manufactured. Such equipment helped in the dramatic salvage of the Normandie, and today is playing an important role in clearing essential harbors overseas of wreckage and sunken hulls.

By a fortunate coincidence, the hub of the rubber industry in the 1840's was located in New York within a block or two of Schrader's shop. Among his neighbors were the Goodyear brothers, one of whom—

Charles—had made the highly important discovery of the vulcanizing process in 1839. The Goodyears came to August Schrader when they needed brass fittings for their rubber products and reliable valves for their air pillows and life preservers. (In those days, women found rubber bustles a "must" for attaining the fashionable figure. Interestingly enough, the oral valve, produced today for the life vests and life belts used by our Armed Forces, is essentially the same as when it was introduced in milady's bustle).

In the company's files is an 1847 invoice showing sales of "life preserver valves" and "moulds" to the firm of Goodyear and Ely. Within five years after the founding of his business, Schrader was established as an expert in the production of metal parts for the rubber industry. Out of this close association and early experience came the Schrader valves of today.

History of Pneumatic Tire Valves

Continuing its tradition of service to the rubber industry, the Schrader organization has been concerned with making valves for pneumatic tires since shortly after the introduction of pneumatic bicycle tires in England in 1888 by J. B. Dunlop. From 1891 on, improvements in design were made until, in 1898, the standard tire valve was made with its core replaceable in one unit. This Schrader type valve has been an American standard for forty-seven years and a world standard for more than twenty-two years.

It has been this standardization which has proved so valuable not only to the automotive industry, but to the current war effort. Every valve cap and core on every bomber, gun mount, truck, staff car, jeep, motorcycle and bicycle is interchangeable in every standard valve —not only on American vehicles, but on all Allied vehicles.

Although early automobile manufacturers were dubious about pneumatic tires, they soon recognized their superiority. As in the manufacture of tire valves, Schrader pioneered in the design of tire pressure gauges, air chucks for inflating tires, tire valve tools, air control and air handling equipment.

In 1930, Schrader became a subsidiary of the Scovill Manufacturing Company, and in 1935 was made a Division of Scovill.

Early diving suit of the 1830's.

Specific Heats of Some Chemical Compounds

FOR research on synthetic rubber it is important to have as much information as possible concerning the properties of the chemical compounds used. A program for obtaining such information has been in progress at the National Bureau of Standards in Washington, D. C., for several years. Recently, two members of the Bureau, Russell B. Scott and James W. Mellors, have determined the specific heats of the vapors of four compounds—1, 3-butadiene, isobutene, styrene and ethylbenzene, and their findings appear in the March, 1945, issue of the *Journal of Research*, published by the Bureau.

The specific heat of a substance is the amount of heat required to raise the temperature of unit mass of the material 1 degree. Specific heats of solids, liquids, and vapors are of value in calculating the amounts of heat involved in plant processes, but the specific heat of a vapor has a more fundamental significance, because of its simpler relationship to the internal motions of the atoms within the molecule. In the case of some compounds, it is possible to calculate the specific heat of the vapor by using spectroscopic data only. With more complicated molecules, such as those dealt with in the present study, the spectroscopic data alone do not permit the complete solution; calorimetric data extending to very low temperatures must also be utilized.

In addition, certain assumptions must be made before values of specific heat can be calculated. It is in these cases that the experimental values of specific heat are very useful. If the calculated values agree with the experimental, the accuracy of the assumptions is demonstrated, and it is possible to calculate specific heats at high temperatures where the experimental method would be unsatisfactory. The calculations are not limited to specific heats. Other thermodynamic properties, which enable the chemist to predict reactions and compute changes of heats of reaction with temperature, can also be obtained. The measured specific heats of the vapor provide one of the best checks of the accuracy of these calculations.

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The Contribution of
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is complete

For tires Statex-93 presents a balanced reinforcement advantageous both in treads and inside stocks. Used straight or blended with Micronex, Statex-93 assures long life because of a minimum of premature failures.

In butyl inner tubes Statex-93 assures good modulus and tensile, uniform gauge and good molding.

Statex-93 makes a high GR-S content practicable in footwear. Thus, it is of special advantage in the finest grades and performs well in air cures.

Loadings of 50 to 60 parts of Statex-93 produce smooth and resilient wire jackets which exhibit good all-around physical properties. Curing characteristics are well adapted to continuous vulcanization.

In mechanical goods Statex-93 reinforces mineral fillers and softer carbons and is useful to blend with the finer particle channel types. Statex-93 combines resilience and low heat build-up with resistance to deflection under load.

Statex-93 offers the greatest preponderance of desirable features for general compounding. It is readily compounded into all synthetics. It develops smooth and rapid extrusion—uniform gauge and low shrinkage. Calendered it assures glossy sheets and sharp knurling.

Statex-93 is the all-purpose carbon for synthetics.

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Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.

Part XVII

Schmidt—U. S. Pat. 2,332,265—Oct. 19, 1943. *Pressure Sensitive Tape.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

A transparent pressure sensitive sheet suitable as adhesive tape is obtained by applying the adhesive coating onto a transparent backing film of plasticized gamma-polyvinyl chloride containing less than 20% of a plasticizer which may be dibutyl phthalate, tricresyl phosphate, tributyl aconitate, dioctyl phthalate, butyl phthalyl butyl glycolate, etc. The adhesive coating may consist of 50 to 75% rubber, or latex, or a polybutadiene, interpolymer of butadiene with other polymerizable compounds, etc., together with 15 to 35% of a polyisobutylene, either the oily plastic or elastic high molecular weight polymer, and 5 to 15% of a tacky resin, such as ester gum, etc., rosin, melted rubber. In the example, a 10% cyclohexanone solution from a mixture consisting of 100 parts of polyvinyl chloride, 5 parts of dioctyl phthalate, and 2 parts of the monoester of glycerine with cottonseed fatty acid, is deposited on a polished metal drum heated at 150° C. to form a transparent film of the required thickness. This film is dried, stripped from the drum, and coated on one side with a pressure sensitive adhesive containing 20 parts of natural rubber or a synthetic butadiene polymer, 7 parts of an elastic polyisobutylene, and 3 parts of ester gum dissolved in a liquid solvent consisting of 20 parts of benzene and 80 parts of gasoline. This coating is dried at 30° to 50° C. into a glossy, transparent layer which is highly resistant to light and air influences.

Uffelmann—U. S. Pat. 2,332,357—Oct. 19, 1943. *Airplane Crash Pad.* (Assigned to Dunlop Tire & Rubber Corp., Buffalo, N. Y.).

A crash pad for airplanes, etc., consists of a body of latex foam molded with openings extending through the body. Such a body pad is flocked by first applying an adhesive cement and then distributing fiber flock of wool, cotton, rayon, Celanese silk, etc. Thus, one or more faces of the molded foamed latex can be coated with a highly concentrated solution of rubber containing light fillers, or a polychloroprene solution cement, or an aqueous dispersion of rubber or polychloroprene. When the cement coating has dried into tacky condition, the fiber flock, which may be of the same color as the cement, is distributed uniformly thereover and cured at about 150° F. A suitable cement may be made from 18 lbs. of polychloroprene, 1 lb. each of calcined magnesia and zinc oxide, 1 lb. of rosin, and about 1/5 lb. of a green pigment. Such a mixture may be dissolved in xylol to form a 25% solution. Green cement and green fiber flock will diffuse glare.

Dorough and Latham—U. S. Pat. 2,332,373—Oct. 19, 1943. *Flexible Sheets.* (Assigned to E. I. du Pont de Nemours & Co., Wilmington, Del.).

A transparent screen, to be used for outdoor exposure, which is transparent and resistant to ultra-violet radiations, can be produced by coating an open mesh fabric with a continuous transparent coating of a polymeric material to fill the meshes of the fabric and form smooth, uniform coatings on both faces. The open mesh fabric may be of galvanized iron wire, copper wire cloth, nylon, etc. The transparent polymeric coating is preferably from a polyethylene of molecular weight above 6,000, but polymers from 1, 2-dichlorethylene, chloroprene, tetrafluorethylene, vinyl ethers or ketones, N-vinyl phthalimide, vinyl thiol acetate, stilbene, etc., may likewise be used. These polymers are applied in the form of powder or by dipping in a solution thereof, or by pressing preformed sheets thereto. In whatever form the coating is applied, the coated layer is subjected to heat at a temperature above the melting point of the polymer and then cooled quickly by quenching in a cooling fluid, such as water.

Holtzclaw—U. S. Pat. 2,332,514—Oct. 26, 1943. *Ink Roller.*

A roller for inking intaglio printing plates used for printing paper money, stamps, etc., consists of a metal core and a relatively thick surface layer having an ink-holding surface with a hardness of about 4 to 5 in the scale of hardness. This ink-holding surface is provided with a multiplicity of tiny, discrete ink holding pits or cells which can be abraded away to form a new ink-holding surface, thus restoring the surface to the same ink-holding characteristics. It is found that finely divided dry sodium chloride, which has been ground and sieved through a 100-mesh sieve, when incorporated in rubber or a synthetic polymer from butadiene and acrylic nitrile, or from chloroprene, etc., will be suitable as the inking surfacing layer of the roller. A suitable composition for this layer may consist of natural or synthetic rubber with 30 to 50% of sodium chloride and vulcanizing ingredients. This composition is molded about the metal core of the roller in a layer of the desired thickness and cured at about 285° C. The molded roller is then ground to the true cylindrical surface required in the finished roll and the particles of the salt at its surface are removed by washing with warm water, thus forming the pit ink-receiving surface. When this roughened surface has been deteriorated by use, it can be abraded or ground and the salt particles at the surface removed with warm water.

Russell—U. S. Pat. 2,333,201—Nov. 2, 1943. *Outsole for Shoes.* (Assigned to United Shoe Machinery Corp., Boston, Mass.).

A composite outsole comprises a layer from a polyvinyl resin having a ridge-like projection which extends across its upper side in the vicinity of the break line between the shank and ball portions of the outsole. This projection has beveled lateral margins and is of uniform thickness forward and back of the projection. The other lamina is in the form of an upper flexible layer of leather more resistant to bending than the lower polyvinyl resin layer. This leather layer has a beveled forward margin secured to one beveled rear margin of the projection of the resin layer. An upper flexible leather layer is secured to the forepart of the lower layer, this leather layer

having a beveled rear margin secured to the beveled forward margin of the resin layer projection. The polyvinyl resin may be from vinyl acetate or chloride, vinyl acetal, etc., which should contain dibutyl sebacate or dibutyl cellosolve phthalate as plasticizer. To secure the leather layer to the polyvinyl resin, the surface of the polyvinyl resin is roughened and coated with a film of chlorinated rubber. When this film has dried, it is coated with a colloidal solution of polychloroprene. A film of polychloroprene is applied also to the buffed surface of the leather layer. While these coatings are tacky, the two coated layers are superposed and consolidated by pressure.

Fryling—U. S. Pat. 2,333,242—Nov. 2, 1943. *Plastification of Polybutadiene.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

In the processing of interpolymers of butadiene and acrylic nitrile or methacrylic nitrile, plastification is effected easily and without injury to the polymer by masticating the mass between cooled rolls or in an internal mixer in the presence of a continuous stream of cold water for about 10 to 60 minutes. The plastification may be carried out soon after the interpolymer has been produced from a solution or an aqueous emulsion of the monomers, and coagulated, whereby the interpolymer may be plasticized, sheeted and dried in one continuous operation. In the example given, an emulsion interpolymer from 75:25 butadiene-acrylic nitrile mixture is plasticized between the cooled rolls of a rubber washing machine. The polymer is preferably first reduced to crumbs which are fed between the rolls of the washing machine while a continuous stream of cold water is directed in the nip of the rolls over the polymer. The rubbery interpolymer becomes hot at first while cold water drenches it. It, however, loses its nerve gradually while the temperature of the stock drops, thus obtaining a good plasticized stock which is dried at 70°C. A compounded stock is obtained in incorporating the following mixture in the plasticized interpolymer: 50% of channel black, 5% of zinc oxide, 3.5% pine tar, 1.5% lauric acid, 1.25% sulfur, 1.25% 2-mercapto-4, 5-dimethyl thiazole, and 1% anti-oxidant. An interpolymer of butadiene with methyl methacrylate or a heteropolymer from butadiene, acrylic nitrile, and styrene can likewise be plasticized.

Youker—U. S. Pat. 2,333,403—Nov. 2, 1943. *Plastic Polybutadienes.* (Assigned to E. I. du Pont de Nemours & Co., Wilmington, Del.).

Plastic polymers from butadiene hydrocarbons are prepared, without the use of plasticizing substances, by effecting the polymerization in the presence of selenium, tellurium or mixtures thereof, with or without sulfur as catalyst. Butadiene, isoprene, dimethyl butadiene, etc., may be polymerized alone or with styrene, pinene, camphene, monovinyl acetylene, vinyl ethinyl alkyl carbinols, vinyl chloride, vinyl acetate, tetramethylallyl orthosilicate, acrolein, methyl vinyl ketone, acrylic or methacrylic or chloracetic acids, furyl acrylic acid, alkyl acrylate, furyl acrylate, methyl chloracrylate, acrylic-amide, methacrylic urea, acrylic or methacrylic nitrile, dimethyl fumarate, vinyl phthalimide, vinyl ethyl sulfide, chloroprene, drying oils, etc. The polymerization is preferably carried out in the form of emulsion in an acid medium. Thus, 100 parts of butadiene, with or without a suitable quantity of any of the above polymerizable compounds, are mixed with 22 parts of carbon tetrachloride, 0.5 part of benzoyl peroxide, and about 2 parts of selenium or tellurium or a mixture of the two, and emulsified in 127 parts of water containing 8 parts of C-cetyl betaine and 0.3 part of acetic acid, and polymerized at 60° C. for 65 hours. In the polymerization there may be used 1 part each of selenium and tellurium with 0.5 part of sulfur as catalyst. This polymer when coagulated will have good plasticity. The emulsifier should preferably be removed from the polymer by washing with warm water or by solvent extraction. The plasticity may be further improved by the incorporation of mercaptans, carbamates, thiazyl sulfides, etc.

Daston—U. S. Pat. 2,333,476—Nov. 2, 1943. *Electrical Resistor.* (Assigned to U. S. Rubber Co., New York, N. Y.).

A small fixed electrical resistor which will have a relatively high current carrying capacity and is particularly designed for electronic circuits in radio and in amplifier devices consists of a tubular base in the form of a varnished cambric fabric, known in the radio field as "spaghetti" sleeve. Over this base tube there is wound a tape fabric coated with an electrically conducting rubber composition in the form of a helix with the margins of the tape lying in spaced relation so that the path of the electrical conductivity follows the helical path of the tape. The ends of the complete tube are joined to terminal wires connected with a source of current. The interior of the tube is filled with a moisture-proof wax or asphalt so as to embed the resistor assembly rigidly within the tube leaving the terminal wires projecting from the ends. The helical fabric tape is coated with a solution or an aqueous dispersion from a mixture containing 100 parts of rubber, part of which can be substituted with nylon, neoprene, Thiokol, polybutadiene, etc., with 85 parts of acetylene gas black, 15 parts of zinc oxide, 0.75 part of an anti-oxidant, 2 parts of an accelerator, 0.75 part of sulfur, and 7 parts of a softener. When the rubber, with or without a quantity of neoprene, Thiokol, etc., is in the form of latex, the acetylene black is agitated in the latex with the other ingredients and the dispersion applied to the fabric tape.

Lewis and Weiss—U. S. Pat. 2,333,800—Nov. 9, 1943. *Printing Rolls.* (Assigned to Vulcan Proofing Co., Brooklyn, N. Y.).

This is a division of U. S. Pat. 2,243,386 for making a printing roll having a printing surface from a composition containing 100 parts of a Glyptal resin in the C-stage, 12.5 parts of a phenolaldehyde-alkyd resin condensation, 15.5 parts of polychloroprene with 2.5 parts of curing agents, 7.75 parts of soft brown factice, 7.75 parts of hard brown factice, 4.75 parts of cumar resin, and 0.2 part of pine tar, the latter functioning as accelerator for the cure of the polychloroprene, while the polychloroprene acts as stabilizer for the glyptal resin. In making the printing roll, the metal core is covered with a cushioning layer of soft rubber and the Glyptal resin composition is formed into a sheet which is wrapped about the cushioning layer to form a layer about 0.075 inch thick. This assembly is covered with a porous fabric and subjected to dry heat so as to cure the polychloroprene. The fabric cover is then removed and the roll machined to the required diameter. To adhere the Glyptal resin surfacing layer to the rubber cushioning layer, there is used an adhesive applied to the soft rubber or/and the surfacing layer. Such adhesive may consist of 52 parts of rubber, 25 parts of a cumar resin, 2 parts of sulfur, 5 parts of zinc oxide, 0.25 part of tetramethyl thiuram sulfide, 0.5 part of Trimene Base, 10 parts of whiting, and 16 parts of lithopone.

Allison—U. S. Pat. 2,334,526—Nov. 16, 1943. *Abrasive Products.* (Assigned to Allison Co., Bridgeport, Conn.).

Abrasive wheels in which the abrasive grains are bonded with polybutadiene, or an interpolymer of butadiene with acrylic nitrile or styrene—Hycar, Chemigum, Buna S, Perbunan—are obtained by using a solvent plasticizer for the butadiene polymer or interpolymers. Such solvent plasticizer may be unsaturated alcohols, aldehydes, or ketones, which have the tendency of condensing or reacting with certain synthetic resins added to the polymer binder, and include furfural, acrolein, benzaldehyde, benzyl alcohol, furfuryl alcohol, etc. These solvent plasticizers will normally react with reactive phenol-aldehyde resins, urea-aldehyde resins, amine-aldehyde resins, melamine resins, etc. For example, 36 parts of No. 46 abrasive grains with 90 parts of No. 90 abrasive grains are worked in a mill with 8.5 parts of a mixture from 10 to 20 parts of furfural or furfuryl alcohol, etc., 100 parts of a butadiene-acrylic nitrile, and 35 parts of sulfur. About 6 parts of a phenol-aldehyde resin, urea-aldehyde resin, etc., are also added to the abrasive mixture. The complete abrasive material is molded into a wheel of the required size which is vulcanized into an abrasive article having oil resistance and good abrading quality. When a larger quantity of furfuryl alcohol, etc., is used as the solvent plasticizer, the butadiene polymer or interpolymer can be brought into solution, in which case the abrasive fillers and the synthetic resin are merely agitated in the solution. It is

claimed that during the vulcanization of the article the furfuryl alcohol or furfural, etc., will react with the phenolic or urea resin, etc., to form a new type of condensation product which is intimately combined with the abrasive and the butadiene polymer binder to form abrasive articles of improved strength.

Read—U. S. Pat. 2,334,582—Nov. 16, 1943. *Plasticized Polybutadienes.* (Assigned to Jasco, Inc., New York, N. Y.).

A plasticizer for butadiene polymers and interpolymers, polychloroprene, rubber, cyclized rubber, etc., is obtained by extracting a petroleum distillate derived from aromatic oils by means of a solvent containing a preponderant quantity of a phenol with small quantities of water or other liquids at a temperature of about 110° to 160° F. The extracted oil will have about 76% content of aromatic compounds. On removal of the solvents in the presence of excess sodium hydroxide and at a pressure below 100 mm. of mercury, there will be obtained a fraction having a boiling point above 700° F. and a viscosity of about 2,000 secs. Saybolt at 210° F. Such high boiling point aromatic oils have been found particularly effective for the plasticization of interpolymers of butadiene with acrylic nitrile, or for other polymers when used in quantities from 5 to 35% of the polymer. This particular oil can be used also in combination with polychloroprene, isobutylene-butadiene interpolymers, etc.

Konrad and Ludwig—U. S. Pat. 2,335,124—Nov. 23, 1943. *Butadiene-Styrene Polymers.* (Vested in Alien Property Custodian, Washington, D. C.).

In the emulsion polymerization of butadiene with styrene, it has been found that when the quantity of styrene is between 45 and 75%, the resulting polymer is radically different from the interpolymers in which the styrene is from 25 to 33%. It has been observed that the increase of styrene in the butadiene-styrene interpolymer causes an improvement in the plasticity and workability of the interpolymer as well as in its solubility. Thus, while a 75:25 butadiene-styrene interpolymer vulcanizate has a tensile strength of 60 Kgs./cm.^{2}, a similar vulcanizate from a 50:50 butadiene-styrene interpolymer has a tensile strength of 90 Kgs./cm^2. The emulsion polymerization of such interpolymers may be effected in an acid or alkali medium. Whatever way the monomers are polymerized, the resulting latex is coagulated in any convenient manner and 100 parts of the polymer are compounded easily with 12 parts each of ordinary zinc oxide and an active zinc oxide, together with 7.5 parts of carbon black, 2 parts of a tar distillation residue, 3 parts of tetrahydronaphthalene, 1.5 parts of sulfur, and 1.5 parts of mercaptobenzothiazyl-sulfen-diethylamide. This compounded interpolymer (A) is vulcanized for 1 hour under a pressure of 2 atmospheres. A similar interpolymer (B) from 75:25 butadiene-styrene is compounded similarly and vulcanized under the same conditions. The following differences in properties are observed: The tensile strength of (A) is 140 Kg./cm^2 and that of (B) is 70 Kg./cm^2; the percent elongation of (A) is 735 and that of (B) is 850; the Shore hardness of (A) is 55 and that of (B) is 50; the elasticity of (A) is 43% at 20° C. and 68% at 70° C. and that of (B) is 65% at 20° C. and 60% at 70° C.

Harrap—U. S. Pat. 2,335,208—Nov. 23, 1943. *Reinforced Asbestos-Cement Sheets.* (Assigned to Turners Asbestos Cement Co., Ltd., Rockdale, England).

A building unit for roofing, siding, etc., contains a corrugated rigid base of an asbestos-cement mixture and a proofed fibrous fabric attached to the back face of the base by means of a cement which has a degree of adhesion for the layers sufficiently low that an impact of sufficient force will pull the fiber layer away from the asbestos-cement base, but sufficiently high so that the composite product can be handled without separating and without damage. The fiber sheet may be from hessian, hemp, flax, cotton duck, artificial silk, coconut fiber, etc. These are rendered resistant to decay by treatment with bitumen, cellulose derivative, Hevea or gutta rubbers, polyvinyl chloride, polyvinyl acetate, polychloroprene, etc., which may contain rot-preserving substances, e.g., copper compounds, etc. The face of this proofed fabric to be joined to the asbestos-cement base is coated with an adhesive, preferably a latex cement composition containing 250 parts of a 35% latex, 60 parts of a 140° T. sodium silicate, 460 parts of water, 2.5 parts of sulfur, 1 part of zinc isopropyl xanthate, and 1 part of phenyl beta-naphthylamine. The coated fiber sheet may then be pressed onto the corrugations of the asbestos-cement base with a fluted roll or in any other convenient manner. To produce a composite structure in which the layers are more firmly bonded at the edges than in the middle, the edges of the fiber sheet are given a strip coating of the same latex cement. Thus when the sheet is pressed onto the corrugated asbestos-cement base, there is effected a stronger bond at the edges than in the middle.

Szegvari and Feikert—U. S. Pat. 2,335,321—Nov. 30, 1943. *Treating Sheer Fabrics.* (Assigned to American Anode, Inc., Akron, Ohio).

The life of sheer fabrics from wool, cotton, nylon, rayon, silk, and even from glass fibers, is increased and the appearance improved by treatment with an aqueous dispersion from a rubber-like material, such as an elastic polyisobutylene, and a phenol-aldehyde resin, in which the phenolic resin should be in the quantity of from 5% to 25% of the total solids of the dispersion, for the purpose of destroying the tackiness of the material. Instead of the phenol-aldehyde resin, there may be used shellac, a butadiene-acrylic nitrile interpolymer, etc. In the example given, the treatment is carried out with sheer hose from natural silk or from synthetic silk-like fibers. These silk stockings are first immersed for about 3 minutes in an "introfier" solution containing 25 cc. of a 20% aqueous solution of potassium oleate, 20 cc. of Immersol TX in the form of a 15% solution, 15 cc. of Aquarex D, and 5 cc. of a 28% ammonium hydroxide solution, the solution mixture being diluted in 1 gallon of water. Any excess liquid is removed by centrifugation and the stockings are then dipped in an aqueous dispersion of the rubber-like material. This dispersion may consist of 100 parts of an elastic high polymer polyisobutylene having a molecular weight of about 200,000 with 17 parts of pre-masticated crude rubber, and 15 parts of a tack-destroying plastic which is preferably a phenol-formaldehyde resin in the form of aqueous emulsion, or Perbunan. The pre-masticated rubber can be replaced with a polybutadiene, polychloroprene, etc. The mixture is dispersed in water in any convenient manner and 2 parts of "phosphotex," a phosphate salt stabilizer, and any desired quantity of vulcanizing ingredients with an anti-oxidant. This dispersion is adjusted to about 20% to 25% solids and the silk stockings are kept in this bath for about one-half minute after which they are passed through tight set rubber-covered wringer rolls to remove excess liquid and then subjected to a blast of air to blow off any bridging films from the interstices of the fabric. The hose are now mounted on "boarding forms" and dried for 5 minutes at 150° F. They are then treated with the vapors of formic or acetic acids to complete the coagulation of the solids in the dispersion, dried, and vulcanized at 220° F. Finally, they are washed with a dilute soap solution, with water, dried, and dyed, if desired.

Wright and Bohmer—U. S. Pat. 2,335,331—Nov. 30, 1943. *Lubricating Material.* (Assigned to Jasco, Inc., New York, N. Y.).

A lubricating material particularly suitable on pumps handling sulfuric or nitric acids or other corrosive liquids consists of a polyisobutylene or butylene-butadiene interpolymer in which the quantity of butadiene is relatively small, the polymers having a molecular weight above 100,000, together with an oil-free petrolatum, a small quantity of wax (if desired), and the required quantity of a lubricating oil. For example, the lubricating material may comprise 50 to 85 parts of a white, viscous mineral oil, 10 to 50 parts of petrolatum, 0 to 10 parts of paraffine wax, and 5 to 25 parts of an isobutylene polymer or interpolymer with a small amount of butadiene. Such a lubricating material has the consistency of a petroleum jelly and can be used as a nitration-resistant lubricant for pumps or for impregnating packings to be used in such pumps.

(To Be Continued)

Editorials . . . . . .

Tire Plant Expansion

EVER since Dr. Benjamin Franklin Goodrich established Goodrich, Tew & Co., predecessor of the B. F. Goodrich Co., in Akron in 1870, Akron has been known as the "Rubber City." Through lean times and good times, through prosperity and depression, Akron has retained that title. Now, however, because of the need for increased quantities of heavy-duty tires for both military use and essential civilian transportation Akron is faced with the possibility that it may lose its seventy-five year crown and become just another rubber manufacturing center.

Decentralization of tire manufacturing facilities lies behind this challenge to Akron. Under both the "within-existing-walls" program and the new heavy-duty tire program, new and increased tire production facilities are being readied in various sections of the country. True, some of this expansion is taking place in Akron tire plants, but by far the new facilities will be outside of that area. New tire plants are now being constructed in Tuscaloosa, Alabama, Nashville, Tenn., Pottstown, Penna., Houston, Texas, Ottawa, Illinois, Kansas City, Kansas, and Chattanooga, Tenn. Additional factories are being constructed adjacent to present plants.

Eventual decentralization of tire manufacturing production, to take advantage of lower wage scales and better distribution facilities, and to place factories closer to raw material centers, was inevitable. The necessity of providing increased supplies of military tires has simply hastened the process by some ten years or more. Although the need for the new plants was dictated by military necessity, there is little doubt that their location was determined by the tire manufacturers with a weather eye open to tomorrow's competitive struggle. And there can be little doubt that all of the additional plants now under construction, all being built with DPC funds, with all be purchased by the operators for continued production in the post-war period. The potential capacity of these new plants outstrips the combined potential of Akron's tire factories.

Surprise has been expressed in some quarters that the rubber union has not violently opposed the construction of the new tire production units in outlying districts. It will be recalled that such opposition was expressed by the United Rubber Workers of America (C.I.O.) in all previous cases of proposed decentralization. The answer to that is simple. The rubber union has grown to such proportions and its various locals are now so strong in their respective spheres of influence that the union no longer fears decentralization as it did in its formative stage. Furthermore, the tire manufacturers are reconciled to unionism and realize that labor-management relations are essential irrespective of plant location.

Director Collyer

EVER since Pearl Harbor the problem of rubber and the rubber industry has been a constant headache. First it was the necessity of creating synthetic rubber facilities, then it was the problem of conversion from crude to synthetics, and now it is tire production, coupled with sufficient supplies of components to produce the needed tires. Fortunately, Washington has selected the proper leaders to see us over each hump. Jeffers "bulled" the synthetic rubber program through, Dewey carried conversion through with few flaws, and now John L. Collyer, president of the B. F. Goodrich Co., has been named Special Director of Rubber Programs to guarantee sufficient tires for both military use and essential civilian transportation.

The selection of Mr. Collyer is said to have been made by James F. Byrnes, while still in his capacity of Director of War Mobilization, with the approval of President Roosevelt. A better choice would have been difficult. Mr. Collyer is a "tire" man and combines technical knowledge with business sagacity. Since 1923 he has been closely associated with tire manufacture and its attendant problems. He is accustomed to thinking in terms of quantity. He is a driver, has an avid distaste for red tape, and has the ability to select capable assistants. There is a big job to be done in solving the tire problem. John L. Collyer can and will do it.

CURRENT NEWS OF THE MONTH

RUBBER PROGRAM STEPPED UP CONSIDERABLY AS COLLYER IS NAMED AS SPECIAL DIRECTOR

ACTIVITY in the rubber field this past month assumed the proportions which were in evidence early in 1942, with major events occurring thick and fast. These included the appointment of John L. Collyer, president of the B. F. Goodrich Co., Akron, as special director of rubber programs for the government; additional amendments to Rubber Order R-1 designed to still further conserve crude rubber and carbon black; approval of seven more projects in the heavy-duty tire program; an accelerated program to provide increased production of carbon black, and the year-end report of the WPB Rubber Bureau. All of this activity is, of course, interlaced, and it is Mr. Collyer's job to pull all of the strings until every bottleneck is broken and the military and civilian tire needs are fully met.

Mr. Collyer's appointment as special director of rubber programs was announced on March 21 by J. A. Krug, Chairman of the War Production Board. It was stated that, with the full support of President Roosevelt and James F. Byrnes (who has since resigned as director of the Office of War Mobilization and Reconversion), Mr. Collyer had been "drafted" for three months to head up the vital rubber programs. As special director, Mr. Collyer will be responsible to the WPB chairman and will act with his full authority. Among other duties, he will direct the activities of the WPB Rubber Bureau. The resignation of James F. Clark, former director of the Rubber Bureau, became effective March 31.

Background of Special Director

John L. Collyer, the new special director of rubber programs, has been prominently identified with the rubber industry here and abroad for many years. Starting in business in the shipbuilding industry, Mr. Collyer, at the age of 29, was invited by the Dunlop Tire & Rubber Co., Buffalo, N. Y., to become its vice-president, a position he held until 1929 when he went to the parent company in England as works director.

In 1931 Mr. Collyer was appointed director of Dunlop manufacturing operations in 12 countries throughout the world. In 1937 he was made joint managing director, which position he resigned to accept the presidency of the B. F. Goodrich Co. On his return to the United States, Mr. Collyer in early 1940 advocated the establishment of a government-sponsored synthetic rubber program as a national safeguard against possible loss of our principal sources of supply for natural rubber in the event of war in the Far East.

Mr. Collyer served as an industry adviser to the State Department in rubber meetings with representatives of the governments of Great Britain and the Netherlands held in England last year and in the United States this year. He is a member of the executive committee of the Business Advisory Council of the Department of Commerce.

Trainer Named As Assistant

One of the first actions taken by the new special director was the appointment of J. Edward Trainer as his assistant. Mr. Trainer is on loan for a limited period from the Firestone Tire & Rubber Co., of which he has been vice-president in charge of production for the past seven years. He has a broad background of experience in production, engineering and construction.

According to Mr. Collyer, initial assignments given Mr. Trainer include work on the following problems: (1) Assurance of sufficient supplies of more than 200 component materials needed for tires and other essential rubber products; (2) Necessary manpower; and (3) Manufacturing expansions authorized for completion during 1945. Among the component materials mentioned were textiles, rubber chemicals, bead wire, reclaimed rubber and natural rubber. As far as carbon black is concerned, it was stated, Mr. Trainer will work in close contact with the Special Inter-Agency Committee named to work out this bottleneck.

Collyer Issues Statement

Upon his acceptance of the job of special director of rubber programs on March 21, Mr. Collyer issued the following prepared statement:

Present and impending shortages of several component materials for tires and other rubber products are national problems that need to be solved promptly. We must obtain as quickly as possible the increased production which is absolutely

John L. Collyer
named special rubber director

J. Edward Trainer
named assistant to Mr. Collyer

essential to the military success of the Allied Nations. The Government has advised that this urgent necessity for production will prevail until both Germany and Japan are decisively defeated and civilian requirements met.

The position today, in terms of military and civilian shortages, is more severe than at any time since Japanese conquest of the world's principal natural rubber sources forced the United States to build a whole new industry—synthetic rubber—to provide the main raw material for tires and other war necessities. Government and industry already have performed a near miracle in creating this new industry.

Although consumption of synthetic, natural and reclaimed rubber is at a rate greater than in any pre-war year, we still face dangerous shortages of tires and other vital rubber products. Employees of all grades and ranks in the rubber industry and leaders of the rubber workers' unions, some of whom recently returned from a tour of the European battlefronts, are all mindful of the present critical situation.

In coping with the complex rubber problem the United States has been attacking a moving target. War demands have gone up. A new Government program to provide increased military tire manufacturing facilities is scheduled to come into production during the latter months of this year, augmenting the expansion of existing plants and the creation of new manufacturing units undertaken in 1943 and 1944. Until these new plants are complete and in full operation, the nation's military and essential civilian tire stocks will continue to be short.

It has been estimated that 930,000 tons of synthetic and natural rubber will be consumed in the United States in 1945, and 1,100,000 tons in 1946. The actual consumption of synthetic and natural rubber in 1944 was 711,000 tons.

More than 150 materials of different types and grades are needed for tires and other rubber products. Increases in production of many of these materials must be obtained to keep the scheduled expansion of the program in balance. Most urgently needed at present are supplies of carbon black, rayon cord, cotton cord and fabrics, natural rubber and bead wire. The manpower problem is of primary importance in these programs.

Military success is predicated on uninterrupted war production and transportation in which tires and other rubber products play a major home-front role. The necessity of maintaining essential cars, trucks, and buses on the nation's highways is inseparable from the task of supplying the vital needs of the armed forces.

Conservation of all tires now in service is more necessary than ever before. Strict adherence to driving speeds of 35 miles an hour and less should be the civilian order of the day.

I am confident that the same teamwork on the part of Government, industry and the people, which has brought us this far toward solving our rubber problems since Pearl Harbor, can be relied upon in the present emergency.—End of Statement.

Changes in Rubber Order

Two additional changes have been made in Rubber Order R-1, both designed to save crude rubber and carbon black. In addition, a special limitation order has been issued on camelback production. The changes were incorporated in Amendments No. 4 and 5 to Rubber Order R-1, as Amended Nov. 9, 1944, and in the issuance of LO L-345.

The effect of Amendment No. 4 to the rubber order will be that by May 1 all conversion from crude to synthetic rubber in the large size truck and bus tubes will be completed. Under its terms, as of April 1, all 16.00 and 18.00 inch cross-section tubes must be made with synthetic instead of natural rubber. After May 1, no 21.00, 24.00, 30.00 or 36.00 inch cross-section tubes may be made with natural rubber. GR-I (Butyl) will be made available for use as a substitute to natural rubber. Conversions in the tube program are expected to result in a saving of approximately 1,000 long tons of natural rubber a year.

In order to make carbon black available for highly essential tires, tubes and other rubber products, Amendment 4 also expands the list of items in which less carbon black will be permitted. The amount of black permitted in heater and radiator hose is reduced, except where the hose is used in military vehicles. Many molded rubber items will hereafter be made with 12% less carbon black and jar rings available for civilian purchase will have 11% less.

The restrictive measures contained in the amendment are expected to result in an estimated saving of 250,000 pounds of carbon black a month. Directions 2, 3, 7, 8 and 10, changing Lists 24 and 25 of Appendix II to Rubber Order R-1, are revoked by the amendment.

An additional saving of 3,000 long tons of natural rubber a year is expected from the terms of Amendment No. 5 to Rubber Order R-1. This amendment, which revises List 24, specifies construction changes involving the use of more synthetic and less natural rubber for the following heavy-duty tires for military procurement: Low platform trailers; 10.00 cross section, mud-snow tires; 14.00, 2-ply highway mud-snow tires; 8.00 to 16.00 combat tires; and 8.25 to 18.00 earthmover tires. The Army and Navy agreed to these specification changes after severe tests.

Under the terms of Limitation Order L-345 on Camelback, which was issued on March 16, during the period from March 1 through June 30, 1945, no manufacturer shall produce any camelback in excess of 137% of the total camelback he produced for all purposes during the months of December, 1944, and January, 1945, as reported to WPB, except to fill orders placed directly by the War Department, Navy Department, Maritime Commission, Aircraft Resources Control Office, or Foreign Economic Administration for Lend-Lease account. In addition, production during any month shall not exceed 35% of the total production for the March 1 to June 30, 1945, period.

Miscellaneous New Regulations

Additional regulations issued by government agencies in recent weeks included the following:

Effective with the second (April-June) quarter, the WPB Rubber Bureau will allocate directly cotton broad-woven fabrics for the manufacture of rubber products. Application for such fabrics must be made on Form WPB-2842 and filed with the bureau. This step was taken to control the quantities of broad-woven fabrics used by the rubber industry and to insure that quantities of such materials may be procured by the industry.

Dealers whose stocks of men's rubber boots and rubber work shoes have been damaged by fire or other accidental cause to the extent that they cannot be sold for ration certificates may be authorized by OPA district offices to mark and sell such footwear ration-free, according to Amendment No. 16 to Ration Order 6A, effective April 2. The amendment sets up price restrictions on the sale of such boots and shoes.

Hydroquinone, used principally in the manufacture of synthetic rubber, has been placed under allocation control. Allocation is achieved in Schedule 101 to the chemical order, M-300.

Control of carbon tetrachloride has been tightened. Suppliers are now required to list on their consumption reports the names of customers ordering more than 3,500 pounds a month.

Additional Tire Projects

Seven additional projects in the truck tire expansion program have been announced since our last report, bringing the total of such approved projects to 39. These seven additional projects, arranged by location for convenience and in order of their approval, were:

Wadsworth, Ohio—To be operated by Bearfoot Sole Co. $200,000 allocated of total estimate of $550,000 for new building and machinery and equipment. (Although no truck tires will be produced at Wadsworth, the purpose of the DPC authorization is to enable Bearfoot Sole to transfer all of the footwear production which it has been carrying out in the Seiberling Rubber plant at Barberton, Ohio. In this manner Seiberling will be able to expand its production of truck tires at Barberton to 143,500 units per year. The Wadsworth plant will be devoted to the manufacture of rubber heels, soles and footwear.)

Emeryville, Calif.—To be operated by Oliver Tire & Rubber. $200,000 allocated of estimated $400,000, of which approximately $100,000 will be supplied by Oliver. Allocation covers two additions to present buildings, alterations and new equipment. Estimated annual production, 300,000 truck tubes. Initial production, July, 1945.

Dayton, Ohio—To be operated by Dayton Rubber Manufacturing. $500,000 allocated for additional machinery and equipment. Estimated annual production, 120,000 bogie wheel tires. Initial production, August, 1945.

Akron, Ohio—To be operated by Goodrich. Additional allocation of $250,000 for machinery and equipment. Estimated annual production, 67,000 bogie tires. Initial production, August, 1945. (This is part of the "within-existing-walls" program and total authorizations to date amount to $800,000.)

Newark, Ohio—To be operated by Pharis Tire & Rubber. Additional allocation of $450,000. Estimated annual production, 120,000 bogie tires. Initial production, August, 1945. (Total authorization now amounts to $1,450,000 for this project. Total cost of expansion for project is estimated at $2,400,000. Project includes construction of a new building as well as acquisition of machinery and equipment.)

Chattanooga, Tenn.—To be operated by Mohawk Rubber. $1,250,000 allocated as partial authorization of estimated $2,200,000 for new factory. Estimated annual production, 180,000 truck tires. Initial production, January, 1946.

Chicopee Falls, Mass.—To be operated by U. S. Rubber. $250,000 allocated as partial authorization of estimated $400,000 for additional machinery and equipment. Estimated annual production, 43,200 truck tires and 369,000 truck tubes. Initial production, September, 1945.

In addition to the above, DPC has allocated $90,000 to the Plymouth Rubber Co., Inc., Canton, Mass., as a partial authorization of funds for additional machinery and equipment to increase the production of rubber tape from 120,000 to 600,000 rolls per month and military heels and soles to 180,000 pairs of soles and 120,000 pairs of heels per month. Over-all expenditures for expansions by Plymouth Rubber are expected to total $600,000.

RUBBER BUREAU'S YEAR-END REPORT COVERS TIRE SITUATION

Despite the shortages which exist in carbon black and tire cord, production schedules of 4,875,951 heavy duty tires for the first quarter of the current year will be substantially achieved, according to a statement issued by WPB on March 21. However, the chances for achieving the greatly increased second quarter production of 5,726,671 units, as scheduled last November, appear extremely unlikely. In fact, the second quarter schedule for truck and bus tires has been revised downward to 5,085,604 units.

The revised tire production schedules for the April-June, 1945 period were announced by WPB on March 17. In addition to the reduced production schedule for truck and bus tires, all other schedules were also reduced, as follows: airplane, 330,439 units; passenger and motorcycle, 3,165,000 units; tractor-implement (over 7.50), 150,227 units, and tractor-implement (under 8.50), 230,000 units. These schedules were said to represent a program that is "realistic" and to indicate the number of tires that can be made with the amount of carbon black that can be supplied to domestic tire plants. The March 21 statement of WPB was issued in connection with the release of the 1944 Year-End Report of its Rubber Bureau which, in essence, was the valedictory of James F. Clark, retiring director.

Gradual improvement in April with a still further step-up in May is forecast, however, as a result of intensive measures being taken to increase the output of carbon black, WPB said, until the over-all result will largely overcome the situation by the end of the second quarter when the production of components is expected to keep pace with the large increases in tire requirements.

WPB explained that, of the total large size tires required for essential civilian and military needs during the second quarter, over half are of relatively smaller sizes that temporarily will have to be given second place in the production of the very large military tires, which are a "must" for current military operations. The deficit from the original schedule in second quarter output will therefore become most apparent in the smaller truck and jeep tires where large volume output has already been achieved, WPB said.

Highlights of Year-End Report

The 1944 Year-End Report of the Rubber Bureau contains the following highlights of crude rubber, synthetic rubber, component materials, truck tires and passenger car tires:

Crude Rubber: The tremendous increase in heavy tire production has made crude rubber the most critical of all strategic materials. About all the conversions from crude to synthetic that are possible have been made but, as technological problems are solved, additional conversions will be made.

The November, 1944, production schedules, which are shown in the Rubber Bureau's report, required 144,000 tons of crude rubber in 1945, and would have required withdrawals from the Government's stockpile amounting to about 35,000 tons, as estimated imports will be less than consumption. The increases in heavy tire requirements that have taken place since November may actually make the inroad into the stockpile even greater than 35,000 tons, so that the stockpile reserve will probably drop considerably below 61,000 tons by the end of the year.

The stockpile on January 1, 1945, was 96,000 tons, which is very definitely below the figure considered a safe minimum for this nation. The low level at the end of 1945 will be in striking contrast to the stockpile of 533,000 tons which was on hand at the time of Pearl Harbor.

Synthetic Rubber: The synthetic rubber industry is able to meet the needs for synthetic rubber in 1945 and 1946 with some plant additions, provided sufficient feedstocks and manpower are available to operate all plants in the industry at much beyond rated capacity.

Production of GR-S in 1944 totaled 668,834 long tons. Requirements in 1945 are stated at 881,000 tons and in 1946, 1,054,000 tons. The increased heavy tire program for 1945 may make necessary some upward revision of 881,000 tons programmed for 1945 in November. To achieve the 1,054,000 tons required in 1946, Rubber Reserve plans improvements to government plants amounting to $22,000,000, or about 3 per cent of present Government investment in the synthetic rubber industry, amounting to $725,000,000.

Exhibit "D" of the report illustrates crude and synthetic rubber availability versus consumption for the United States and Canada for 1945 by quarters, as programmed in November, 1944. The revisions in production schedules that have already taken place or are anticipated during 1945 will probably alter the consumption data in Exhibit "D". For example, "war orders" will require more crude as well as more synthetic rubber, while curtailments in favor of military tires may reduce the total amount of synthetic used in passenger tires during 1945.

Generally, no certainty exists as to whether or not 1945 total requirements for synthetic will change. The total requirements for crude, as pointed out previously, will certainly increase above the level programmed in November, 1944, because of greater output of heavy military tires, which still require considerable percentages of crude.

Component Materials: The increase in tire production, as now scheduled, has created shortages in the essential component materials. Carbon black is critically short at the moment. Rayon tire cord also cannot be supplied in sufficient quantity, but cotton tire cord can be substituted in some tire sizes provided enough coarse cotton thread is made available. Bead wire is in a tight position, but relatively simple measures such as minor expansions in the industry and careful scheduling of production are expected to correct this shortage.

The deficiency in rayon tire cord is indicated by figures from the report. November, 1944, estimates of maximum 1945 production of rayon tire cord were 245,000,000 pounds, against 1945 requirements then forecast at 292,000,000 pounds. The 1946 figures were forecast in November at 296,000,000 pounds supply versus 368,000,000 pounds required.

Because it requires 12 to 18 months to build new rayon cord facilities, the shortages of rayon cord will have to be made up by use of cotton cord, by substituting 1.3 pounds of cotton cord in place of each pound of rayon cord. The substitution of cotton cord for rayon cord will call for the consumption of roughly one pound of extra crude rubber for every pound of rayon cord shortage.

Changes in production schedules for the last three quarters of 1945, which are now being analyzed, indicate that requirements for both rayon and cotton cord will have to be adjusted upward. This means that the amount of cotton cord substituted for rayon cord will have to be increased. The relative essentiality of cotton tire cord versus tentage and other war needs for coarse cotton thread will govern the amount of cotton cord to be made available for tires.

Truck Tires: The truck tire production schedule for 1945, as programmed in November, 1944, was as follows:

Tire Group	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
A-1	31,175	28,975	26,475	24,875	111,500
A-2	13,005	15,005	15,605	15,605	59,220
A-3-a	104,167	183,672	205,028	212,028	704,895
A-3-b	914,492	1,101,518	1,234,658	1,439,658	4,690,326
A-4	734,294	947,455	1,152,407	1,457,407	4,291,563
A-5	1,923,556	2,180,996	2,512,361	2,516,861	9,133,774
A-6	1,155,262	1,269,050	1,305,824	1,305,824	5,035,960
Total	4,875,951	5,726,671	6,452,358	6,972,258	24,027,238

In presenting the November schedules for 1945, the Rubber Bureau pointed out that subsequent military needs since November have raised the 1945 total truck tire requirements even further. The requirements for the larger sizes, especially, have been increased very materially, and revised schedules will be announced.

The truck tire expansion programs have been given the highest priority and are being expedited to every extent possible, because of the urgent military need. The expansions will raise heavy tire output from the present annual rate of about 14,000,000 to over 28,000,000 in early 1946.

Passenger Car Tires: In 1944, production of passenger car tires totaled 18,864,000. As projected in November, 1944, the output for 1945 was scheduled at about 22,000,000. The 1946 output was programmed to jump to over 35,000,000.

Since the Rubber Bureau's 1944 report was drafted, the shortages in carbon black have become even more critical. As a result, the carbon black that would have gone into many passenger-car tires during the second quarter will have to be diverted to urgent heavy military tires. The 1945 goal of 22,000,000 passenger car tires therefore can only be met by "over-production" during the last half of the year. Achievement of the goal will depend on the extent to which solutions are found for the shortage of carbon black, the insufficiency of cotton tire cord, and the lack of manpower to build passenger car tires.

Another limiting factor is the extent to which equipment for producing passenger tires is diverted to the production of medium and small truck-tires. Still another factor is the possibility of increases in military requirements for large tires beyond those now programmed for the second half of 1945.

Sunday Production Resumed

Despite the fact that carbon black is still in short supply and despite the fact that the tire manufacturers and workers were released from their pledge of seven-day-week operations on March 7, resumption of Sunday tire production in most plants was achieved by March 25. In other words, seven-day-week operation was suspended for only a week or two. It is estimated that the maximum number of military tires lost by the short return to the six-day-work-week was approximately 70,000 to 80,000 tires. The various restrictive measures on the use of carbon black for passenger tires and other types of rubber goods plus improved scheduling of available supplies are believed to have been the major factors in resuming the seven-day week.

Incidentally, WPB has estimated a reduction of 25% in military tire requirements after V-E Day. In making the estimate on April 6, Special Director Collyer explained that the figure of necessity represents only a temporary estimate with the reduction of military tire requirements largely dependent on the actual arrival of V-E Day. Whatever reduction actually occurs will be diverted immediately to help essential civilian demands. According to Mr. Collyer, accumulated essential civilian heavy-duty tire needs will preclude any cutback after V-E Day of the recently authorized expansion program.

Rayon Situation Serious

While the carbon black shortage has been widely publicized as the factor most seriously limiting tire production, the shortage of rayon fabric is expected to assume similar proportions in the near future. Present rayon facilities are already heavily strained and efforts are being made to build additional production units but, it is pointed out, it takes normally about 14 months to construct such new facilities. As pointed out in the Year-End Report of the Rubber Bureau, production capacity of high tenacity rayon cord is approaching 245,000,000 pounds, against 1945 requirements originally estimated at 292,000,000 pounds.

An increase of approximately 20% in rayon tire fabric production facilities to help ease the shortage of this vital material is momentarily expected to be approved by WPB. The expansion is expected to increase rayon tire fabric production by 50,000,000 pounds annually, bringing total capacity up to approximately 300,000,000 pounds. The increase, it is believed, will be achieved by construction of new units to plants presently producing this type fabric and by additional conversion of plants producing other types of rayon fabric.

At the same time it was learned that representatives of American Enka, American Viscose, DuPont and Industrial Rayon have warned WPB that unless 860 workers are immediately recruited for work in their respective rayon cord fabric plants a 12% deficit in production for the second quarter of the year will result. Failure to get these workers, plus 400 more, within the next several months will cause even greater deficiencies in the future, it was said.

Under the terms of Amendment 7 of M.P.R. 167, effective March 22, manufacturers of high tenacity rayon yarn are permitted to apply for ceiling price increases covering the higher cost of producing this yarn with converted or newly constructed equipment. The amendment applies only to manufacturers operating under WPB directions.

MAJOR STEPS TAKEN TO INCREASE PRODUCTION OF CARBON BLACK

Fourteen steps designed to increase the production of carbon black were announced by WPB on March 29. The program was facilitated through the Inter-Agency Carbon Black Committee. This committee, appointed on March 10, and headed by Michael J. Deutch, special assistant to the WPB Chairman, is composed of Sam H. Sabin, vice-president, DSC; A. P. Frame, director of refining, PAW; Lester V. Chandler, price executive of rubber and chemicals, OPA; J. F. Clark, director, Rubber Bureau, WPB (now resigned); D. P. Morgan, director, Chemicals Bureau, WPB; Frank L. McNamee, deputy chairman, WMC; and W. F. Twombley, assistant director, Chemicals Bureau, WPB.

The most important step taken by WPB has been to give an AA-1 preference rating to all projects for the expansion of facilities in the carbon black industry. A total of 188,100,000 pounds of carbon black a year will be added to the production capacity of the country by these additional facilities, preliminary information on which will be found in the accompanying table. Further expansions are in process of being approved. These will receive a preference rating of AA-1 also.

This priority assistance, and the other

Carbon Black Expansion Projects

(Projects Approved and Granted AA-1 Preference Rating on March 16, 1945.)

Company	Location	Estimated Costs	Estimated Production Capacity*	Type Project	Estimated Completion Date
Cabot Carbon Co.	Guymon, Okla.	$ 262,000	Pipeline	New Facility	June 1945
Cabot Carbon Co.	Borger, Texas	801,666	36.0	New Facility	Oct. 1945
Cabot Carbon Co.	McCoy, La.	1,040,000	5.5	New Facility	Aug. 1945
Cabot Carbon Co.	Wickett, Texas	150,000	Sup. Fac.**	Add'l Equip.	May 1945
Cities Service Oil Co.	Ector County, Texas	224,000	Sup. Fac.	Add'l Equip.	June 1945
Cities Service Oil Co.	North Cowden, Texas	150,000	Sup. Fac.	Add'l Equip.	April 1945
Columbian Carbon Co.	Seagraves, Texas	55,595	Desulfur.†		May 1945
J. M. Huber, Inc.	Borger, Texas	212,400	9.0	New Facility	July 1945
Jefferson Lake Sulfur Co.	Clemens, Texas	360,454	14.4	New Addition	Aug. 1945
Charles Eneu Johnson	Eunice, N. M.	2,825,000	30.0	New Facility	Nov. 1945
Charles Eneu Johnson	Monument, N. M.	410,000	4.6	Addition	Sept. 1945
Phillips Petroleum Co.	Borger, Texas	260,500	16.0	Addition	Sept. 1945
Phillips Petroleum Co.	Borger, Texas	119,310	Sup. Fac.	Add'l Equip.	April 1945
Phillips Petroleum Co.	Goldsmith, Texas	53,000	Sup. Fac.	Add'l Equip.	June 1945
Phillips Petroleum Co.	Eunice, N. M.	142,826	Sup. Fac.	Add'l Equip.	May 1945
Roxboro Steel Co.	Hardin, Texas	350,000	9.6	New Addition	July 1945
United Carbon Co.	Ryus, Kan.	1,105,748	24.0	New Facility	July 1945
United Carbon Co.	Ryus, Kan.	1,248,420	24.0	New Addition	Dec. 1945
United Carbon Co.	Ector County, Texas	158,621	Pipeline	Addition	June 1945
United Carbon Co.	Foster Field, Texas	139,000	Desulfur.		Sept. 1945
United Carbon Co.	Midland, Texas	28,755	Desulfur.		April 1945
United Carbon Co.	Odessa, Texas	1,135,200	15.0	Addition	Aug. 1945
United Carbon Judkins Co.	Ector County, Texas	139,475	Desulfur.		Oct. 1945
		$11,371,970	188.1		

* Millions of pounds per year. ** Sup. Fac.—Supplementary Facilities. † Desulfurization is a process required with certain types of facilities.‡

Note: The above facilities represent 40 per cent of the expansions regarded as necessary to produce carbon black for maximum operation of the rubber manufacturing industry including all expansions. A complete list of new facilities will be announced in the near future.

actions agreed upon, are intended to increase production of carbon black to care for needs of the rubber manufacturing industry in this country and essential export needs and to build up a 30-day inventory, considered a minimum safe working supply. Carbon black shortage has resulted in a reduction in rubber consumption from January and February levels. In January, domestic consumption was 76,000 long tons of synthetic and natural rubber and 21,000 long tons of reclaim rubber. Substantially more carbon black was consumed in January than was produced. The deficit had to come from the nation's stockpile. There is no longer any stockpile and working inventories are depleted.

Before the domestic rubber manufacturing industries can regain January operating levels and meet manufacturing specifications and export requirements, carbon black production must be increased 19 per cent, WPB said. To realize peak schedules now programmed, including truck tire expansions coming into complete production early next year and export requirements for other United Nations, 64 per cent more carbon black must be produced monthly.

Besides priority assistance, the other thirteen steps agreed upon by the Inter-Agency Carbon Black Committee to increase production of carbon black as rapidly as possible are:

(1) The Petroleum Administration for War will make available 10,000 barrels of naphtha and 2,000 barrels of gasoline residue a day. This will add approximately 1,500,000 pounds per month of carbon black. It will require from six weeks to two months to install equipment to process these additional raw materials.

(2) The Petroleum Administration for War will make available 115,000 gallons of propane gas per day at once. This will make it possible to increase production of carbon black by 1,000,000 pounds per month.

(3) As soon as heating demands recede, probably within a month, the Petroleum Administration for War will make available an additional 150,000 gallons of propane gas a day.

(4) The Railroad Commission of Texas is assisting in the emergency by obtaining additional sources of gas for several carbon black plants in Texas. It is estimated that this action will permit the manufacture of 1,500,000 additional pounds of carbon black at once.

(5) The War Manpower Commission has instructed regional and area offices to give the carbon black industry the top labor priority.

(6) The Inter-Agency Carbon Black Committee is reviewing the export requirements for carbon black. Temporarily, at least, it is expected that as much as 5,000,000 pounds of carbon black per month may be diverted from export to the rubber manufacturing industry of this country.

(7) The committee has requested the War Department to take steps to obtain production of carbon black from existing facilities in France.

(8) The possibilities of producing carbon black in the Middle East are being investigated.

(9) The production of carbon black in California, the mid-continent areas, and in Canada where sweet gas may be used, is being pushed.

(10) In Louisiana other steps are being taken to permit the use of sweet gas.

(11) The carbon black industry and government agencies, particularly PAW, are taking steps to make enriched gas available to the industry wherever possible. It is estimated that this action will increase production from existing facilities by as much as 40 per cent in some plants.

(12) With the announced AA-1 preference ratings, it will be possible for the Defense Plant Corporation and Defense Supplies Corporation to expedite new facilities. The completion dates given in the accompanying table are those anticipated as a result of the high priority assistance.

(13) The Office of Price Administration is reexamining pricing problems in the carbon black industry. Some price adjustments already have been approved, and it is probable that additional action will be taken so that the price structure of carbon black will in no case interfere with the maximum production.

Some Facilities Soon Ready

Over and above the recently authorized additions, some previously planned facilities for the production of carbon black will enter the production stage shortly. In an announcement made on March 20, Oscar Nelson, president of the United Carbon Co., revealed that the DPC plant it is building near Odessa, Texas, which will be the largest channel plant in the world, is expected to be in partial operation by May 1 and will attain its rated capacity of 41,000,000 pounds or more of annual production by July 1.

The new channel black plant at Borger, Texas, constructed by J. M. Huber, Inc., is nearing completion, according to R. H. Eagles, company vice-president, and production is expected to start next month. A new furnace type plant, also under construction at Borger, is scheduled for completion in July. These two plants were financed by the company. The ultimate effect of this expansion program, including the output of the newly-authorized DPC channel plant at

Borger, will be to increase Huber carbon black production from 50,000,000 to 93,000,000 pounds per year.

Also nearing completion is the DPC plant near Guymon, Oklahoma, which will be operated by the Cabot Carbon Co. Because of the war emergency, the Oklahoma Corporation Commission was persuaded to depart from its established policy which forbids the use of "dry sweet gas" for carbon black purposes, and such gas, considered more valuable for domestic and commercial purposes, will be used at the plant.

Price Relief Afforded

Three pricing regulations, all covering sales of carbon black to the Defense Supplies Corporation, and all designed to afford some relief to producers, have been issued by OPA in recent weeks.

The first order, effective March 19, established adjustable pricing methods for sales of rubber grades of channel black to the DSC and preceded issuance of new pricing provisions, the latter being issued on March 31 (see below). This order (Order No. 49 under Section 1499.19a of G.M.P.R.) authorized producers to sell at ceilings that were to be adjusted in accordance with the new ceilings to be established, and terminated with the issuance of the new order.

The second order (Order No. 50 under Section 1499.19a of G.M.P.R.), effective March 24, covers sales to DSC of rubber grades of non-specialty furnace blacks produced from propane. This order permits production of additional furnace black by propane enrichment pending determination regarding the extension of the present formula, which covers high cost channel black. The formula provides higher than existing ceilings for increased production by high cost producers, and any maximum price increases found necessary will apply to deliveries to DSC made after March 4, 1945, when the order became effective.

Additional quantities of furnace black are needed, it was explained, as a step in relieving the rubber shortage. The Inter-Agency Committee on Carbon Black has recommended that producers of rubber grades of furnace black increase their output by using propane to enrich their gas supply. OPA explained that it is possible that black produced by this method cannot be made and sold at present ceilings and maximum prices for it may have to be increased, hence the new order.

The new pricing provisions which allow producers higher ceilings for all rubber grades of channel black made under emergency high-cost conditions and sold to DSC, which supersede the adjustable pricing provisions for such blacks mentioned above, are incorporated in Amendment No. 3 to Supplementary Regulation 14F to G.M.P.R.. The action, effective March 31, provides increases above the minimum required by law for the purpose of encouraging the maintenance and expansion of production, according to OPA. DSC will resell the black to the rubber industry at a flat price, based upon the estimated weighted average acquisition cost.

In issuing the new order, OPA explained that WPB has asked that higher ceiling prices be granted to compensate producers for the use of unusual expedients in stepping up their production. These expedients include the use of enriching agents for the gases normally serving as raw materials.

The price increases, which will vary, depending upon the raw materials used, will be determined by each producer, using the formula set forth in the new pricing provisions. The resulting ceiling will be subject to OPA approval. In brief, the formula (for all except new plants) permits the addition of current raw material cost per pound to specified conversion costs in effect during the first six months of 1944.

Higher costs in operating certain new and rehabilitated plants were provided for previously by OPA, when a formula was supplied producers by which higher ceilings could be determined for EPC black when specified high-cost production conditions existed.

The new action expands the formula so as to include all rubber grades of channel carbon black and so as to include a wider range of high-cost conditions. It also includes an automatic adjustment provision to take care of increased costs arising out of raw material contract revisions for existing production.

OPA ESTABLISHES PRIORITY GROUPS FOR PASSENGER CAR TIRES

Because of sharply reduced civilian tire allocations (as outlined below) a preferential list of occupations for use in selecting persons to receive passenger car tires has been prepared by OPA in cooperation with WMC. This list, announced on March 26, will be used in channeling the reduced quota of tires to persons whose transportation needs are regarded as most essential to the war effort. Under the new plan the number of eligibles is not reduced but is classified into four preference groups for the aid of local rationing boards in issuing tire certificates.

First priority, classed as Group I, is limited almost entirely to persons whose occupations are of emergency nature and to workers at establishments faced with production emergencies. Included within this group are eligible physicians, public health nurses, police, and employees at critical war industries, such as those producing urgently needed aircraft and ammunition that are experiencing a manpower emergency. The exact plants, however, will be determined on the advice of local WMC officials.

Group II includes persons employed in other essential plants and those whose occupations are highly important to the war effort. In this group, for example, are farmers, farm workers and representatives of management, labor and Government who recruit for essential establishments.

Group III includes such occupations as buyers for essential establishments and persons who travel to essential establishments on request to perform necessary technical services, such as those who advise these establishments on machinery maintenance problems.

Group IV takes in all other persons eligible for Grade I passenger tires.

In issuing the list OPA made it clear that, in accordance with regular tire eligibility standards, each individual tire applicant must establish his need for a tire even though he is rated in a high preference group.

Tire Quotas for April

Reflecting the serious situation in the tire field, OPA announced on March 18 that only 1,000,000 passenger car tires will be available for rationing in April, as compared with 1,600,000 in March. This 37½% cut, it was pointed out, reduces the monthly allocation below the 1,500,000 mark for the first time since May, 1944, and pushes farther into the future any release of new tires for "A" card motorists. A considerable increase in quotas for trucks and buses for April, however, resulting from a 46% boost in production of these size tires in the last few months, was indicated.

At the time of this announcement OPA also stated that all tire ration certificates dated earlier than December 1, 1944, would be cancelled on April 1. Drivers holding such certificates were allowed to use them up to that date if they could locate tires. After April 1, it was said, drivers may apply for new certificates which are now being issued only to the most essential drivers.

Independent tire dealers asserted that this invalidation of certificates will cut their working inventories from 25 to 60% while leaving manufacturers' factory branches virtually unaffected. These dealers are asking OPA for a revalidation of a percentage of the certificates and specifically request that tire certificates dated prior to December 1, 1944, sent to a manufacturer for replacements should be honored if the order was placed prior to March 17, even if the manufacturer was unable to make delivery.

Sales to Federal Government

Tire dealers, jobbers and wholesalers may now use the ceiling prices established in the retail tire regulation (R.M.P.R. 528) when making sales of new natural rubber tires, tubes and flaps to the Federal Government, according to Amendment No. 9 to M.P.R. 415 (Certain Federal Government Purchases of New Rubber Tires and Tubes), issued

by OPA on March 21. These sellers will now be able to obtain higher prices as a result of this action, which eliminates such sales from M.P.R. 415.

The ceilings in M.P.R. 415 are based on the assumption that the sales covered would be by manufacturers direct to the Government. Occasional instances occur, however, where the Government finds it necessary to obtain supplies from dealers and wholesalers. Such sellers have been reluctant to sell because the ceilings on their sales to the Government have been less than their usual sales prices and in some instances below their cost.

The new action, which is effective March 26, 1945, makes possible the charging of regular retail or wholesale ceiling prices, and will make it easier for the Government to obtain supplies in the occasional instances where it is more practicable to purchase from other than manufacturers.

Wholesale Prices for Rejects

Wholesale ceiling prices for the new category of new tires and tubes known as factory rejects have been established in Amendment No. 4 to R.M.P.R. 143 (Wholesale Prices for New Rubber Tires and Tubes). The ceilings, effective March 26, will be 25% less than the ceilings for factory seconds when the factory reject tire or tube is repaired before being sold, and less an additional 40% of the latter price when sold unrepaired.

Retail ceiling prices for factory rejects were recently announced by OPA. Only a very limited number of such rejects are expected to be available for sale. All factory rejects, as well as factory seconds, will be marked as such by the manufacturers.

Amendments to Ration Order

Two additional amendments to the tire rationing regulations (RO 1A) have been issued since our last report, as follows:

Amendment No. 95, issued March 17 and effective April 1, establishes new transfer arrangements for dealers and manufacturers. For instance, if the replenishment portion calls for a truck tire with a cross-section size 7.50 or smaller, the dealer or manufacturer may transfer a Grade I truck tire with similar cross-section.

Amendment No. 96, issued March 19 and effective April 1, requires that manufacturers return to OPA monthly their portion of tire certificates dated on or after December 1, 1944. The amendment also requires manufacturers to keep certain records and file necessary reports.

Goodyear has developed a typical store design for its dealers with limited amounts of space for display purposes. The fixture plan of the design is flexible and can be adjusted to assure a compact arrangement of merchandise, regardless of the number of obstructions within the space.

NEW YORK GROUP HEARS RECLAIMED RUBBER SYMPOSIUM

The comprehensive symposium on reclaimed synthetic rubber which was originally scheduled to be presented before the Chicago Rubber Group featured the Spring Meeting of the New York Rubber Group, held on April 13 at the Building Trades Club in New York City. Approximately 325 members and guests attended the meeting.

The symposium was comprised of three papers covering the range of problems presented by synthetic reclaim. These were "Technical Problems in Connection with Reclaiming Synthetic Rubber," by Fred S. Conover, chief chemist, Naugatuck Chemical Division, U. S. Rubber Co.; "Compounding Problems with Synthetic Rubber Reclaims," by E. B. Busenburg, chief chemist, Philadelphia Rubber Works; and "Economic Factors Involved in the Transition from Natural Rubber to Synthetic Rubber from the Reclaimers' Standpoint," by John S. Plumb, vice-president, U. S. Rubber Reclaiming Co.

In the first paper, Mr. Conover reviewed the history of the reclaiming of rubber from the patent for the manufacture of crumb rubber taken out in 1853 by Charles Goodyear to some of the recent patents covering the reclaiming of synthetic rubber scrap. He stated that today about 16% of reclaim production is made by the process of Hall and Bushnagel, approximately 3% is made by Mitchell's acid process, and the remaining 80% is made by Mark's alkali process or some modification of that process.

Referring to present day methods, Mr. Conover said that the reclaiming of all currently important types of synthetic rubbers has been successfully accomplished, using equipment now in common use. Today's major problem, he declared, is one of segregation and sorting of scrap materials. Although methods for identification have received much attention and some of them are quite promising, they all take time and the lag between receipt of material and the testing of individual pieces is too great even by the best methods.

In his discussion of synthetic rubber reclaims, Mr. Busenburg, the second speaker, pointed out that these materials have new, different and interesting properties, and although considerable work remains to be done before they can be completely evaluated in all possible lines of application, in his opinion they will find application and offer definite advantage for some purpose. Although the large tonnage scrap item available for the manufacture of reclaimed rubber will be GR-S tire scrap, he said that useful materials can be produced from some of the lesser synthetic scrap, such as GR-S inner tubes, Butyl inner tubes, neoprene scraps, and some others.

Mr. Busenburg presented several slides showing the results of some recent laboratory tests, including a comparison of GR-S whole tire reclaim and similar reclaim made from natural rubber scrap, behavior of synthetic reclaim in the vulcanizing process, natural rubber and GR-S reclaim in a channel black loaded stock, and the effect of partial replacement of Neoprene GN (GR-N) with neoprene reclaim.

The third and final speaker, Mr. Plumb, divided his subject into three major portions: (1) The economic considerations involved in the collection, distribution and grading of scrap rubber; (2) The factors involved in the actual processing and production of the reclaimed materials; and (3) The market possibilities and limitations for the finished product. He said that the reclaiming industry has about two years of natural rubber scrap with which to work and thereafter synthetic rubber tires will appear in increasingly large amounts on the scrap market. Therefore, he pointed out, the reclaiming industry must plan on either a gradual transition from natural rubber to synthetic reclaims starting within the next twelve months or abruptly change over to synthetic reclaims at the end of two years.

Mr. Plumb also said that the market for synthetic reclaims, other than for a few specialty uses, is very small at present, and the only incentive for the rubber manufacturing industry to develop uses for synthetic reclaims must lie in outstanding properties of such reclaims at comparable prices to natural rubber reclaims. This, however, involves technological improvement in reclaiming and rigid control over scrap sorting and collection.

GODFREY L. CABOT BUYS GENERAL ATLAS CARBON

Godfrey L. Cabot, Inc., Boston, Mass., one of the major producers of channel carbon black and an important factor in the production of furnace black, has acquired the properties and facilities of the General Atlas Carbon Division of General Properties, Inc. General Atlas Carbon was the pioneer producer of furnace blacks.

The purchase, made as of April 1, was made through a newly-organized, wholly-owned Cabot subsidiary, the General Atlas Carbon Co. Herron Bros. & Meyer, of New York and Akron, will continue to act as distributor for General Atlas products, and orders for Gastex and Pelletex should continue to be placed either directly through that company or through its local agents as in the past.

According to Cabot, the General Atlas Carbon Co will function as a completely separate organization, with the same personnel which was associated with General Atlas heretofore, including Carl J. Wright, who was vice-president and general manager of the former General Properties division. For the time being Mr. Wright will remain in Texas.

SPECIAL PLAN IS EVOLVED FOR SURPLUS RUBBER GOODS

Solution of a knotty problem concerning surplus mechanical rubber goods has been announced by the Air Technical Service Command, which maintains headquarters at Wright Field, Ohio. Through the joint efforts of the Readjustment and Supply Divisions of the ATSC, the Treasury Department, representatives of the aircraft and rubber industries, and the Rubber Bureau of the War Production Board, a plan has been evolved for the disposition of surplus mechanical rubber goods.

Although the surplus inventories had not yet reached great proportions, the ATSC and the aircraft industry initiated a disposal study to prevent unwieldy accumulations, and to work out procedures which would serve the best interests of the government.

The surplus of mechanical rubber goods had resulted from such factors as design and engineering changes, obsolescence, and production revisions dictated by changing war requirements. Accumulations of inventories in aircraft plants posed problems not only of disposition, but of plant clearance—an important consideration in maintaining war production at high levels.

A number of special features of the inventories complicated disposition. Officials pointed out that a very high percentage of mechanical rubber items used in aircraft production are non-standard and therefore not normally saleable, and that deterioration sets in very rapidly with age. Furthermore, the various compounds of synthetic rubber now being used, and the fact that only natural rubber is economically reclaimable, limited disposal possibilities.

Rubber Experts Aided Classification

Personnel of the ATSC and aircraft manufacturers were not qualified to make the proper initial classification of the surplus items. Arrangements were made to enlist the aid of experts from the rubber industry. The inventories were collected at the 831st AAF Specialized Depot, Shelby, O., and examined there by a group including representatives of industry and interested organizations of the ATSC, personnel of the Rubber Bureau, WPB, the Treasury Department, and representatives of the Resources Division, Hq., AAF.

As a result of this inspection of the items, a schedule is being developed which will enable plant clearance officers to make immediate classification of surplus mechanical rubber goods from inventory records, and to determine their disposition. The items will either be held for sale through commercial channels, held for re-distribution within the aircraft industry, sold for reclamation, or scrapped and sold as junk.

Officials stated that the cooperative effort represents a method of operation which may find many applications in the disposition of surplus property, especially when the items are highly specialized and not readily disposable.

Coming Events

Apr. 26. Ontario Rubber Group, Toronto, Ontario, Canada.

May 1. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

May 11. Akron Rubber Group, Hotel Mayflower, Akron, Ohio.

May 11. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

May 18. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Sept. 10-14. American Chemical Society, Annual Meeting, Chicago, Ill.

Standard Handling Piccolastic

Piccolastic Resins, the polymers of styrene and its homologues, which were recently introduced by the Pennsylvania Industrial Chemicals Co., are being nationally distributed by the Standard Chemical Co., Akron, Ohio. These resins are soluble in aromatic hydrocarbons and, for the most part, are wholly hydrocarbon in structure and therefore non-acid and unsaponifiable. They are acid resisting and alkali-resisting to a high degree, do not support mould or other fungus growth and are not subject to enzyme reaction. They are pale in color, are not subject to change by oxidation, are permanently thermoplastic, and possess heat stability at temperatures up to at least 175° C. Standard Chemical has been carrying on an extensive laboratory testing program for the application of Piccolastic to a broad range of uses in paper and fabric coatings, paper and fabric laminations, pressure sensitive and heat-sealing adhesives, insulation, moldings, and impregnants, as well as to plasticizing and extending needs in rubber products manufacture. Their wide range of melting points and molecular weights are believed to make Piccolastic resins adaptable to hundreds of industrial needs.

Goodyear to Build Heel Plant

The Goodyear Tire & Rubber Co., Akron, is planning the immediate construction of a new plant at Gadsden, Ala., for the manufacturer of rubber soles and heels. The new plant, which will turn out approximately the same products as the firm's Windsor, Vt., factory, will be an addition to the present Goodyear plant in Gadsden, though some of the manufacturing will be done with facilities already there. As soon as military needs lessen, Goodyear expects to introduce several new products in the sole and heel line which have already been developed.

An Index to Vol. 56 of RUBBER AGE will be found on Pages 125 to 128 of this issue.

PNEUMATIC RUBBER TIRES PASS FIFTIETH YEAR MARK

The first set of pneumatic rubber tires ever used on an automobile was placed in service just fifty years ago last month, when Charles A. Duryea, pioneer auto inventor, had a set of single tube tires installed on his car on March 11, 1895. Forerunner of modern high-speed tires, they quickly established the superiority of air-inflated tires over the solid rubber type then in use, and led directly to present day standards of speed, safety and driving comfort.

This first set of tires measured a mere two inches in cross-section and were 44 and 48 inches in diameter, the former being placed on the front wheels and the latter on the rear pair. The same year, on Thanksgiving Day, 1895, this identical set of original pneumatic tires enabled Duryea to win America's first auto race, held in Chicago against a field which included several foreign entries.

Prior to this, pneumatic tires had been tried on bicycles and on racing sulkies with considerable success. In 1894, the famous trotting horse, Nancy Hanks, drew a pneumatic-tired sulky a mile in two minutes four seconds, clipping four seconds from a record set nine years before which had been considered virtually unbeatable.

Hartford Rubber Supplied Tires

However, it remained for Duryea, recognized by many as the father of the American automobile, to be the first to put the pneumatics to the test of a power-driven vehicle. He did this at the suggestion of Colonel Pope, head of the Pope Hartford Company, makers of the well-known Columbia bicycles. Duryea was quick to see that any vehicle equipped with pneumatic tires would roll easier and therefore go faster than solid tires. He placed his order for the novel tires with the Hartford Rubber Works, which later became a part of the United States Rubber Company.

Sixty gasoline-driven and electric cars, including three of foreign make, were entered in the Thanksgiving Day race, sponsored by the *Chicago Times-Herald* for a prize of $2,000 and to be held over a 50-mile course from Chicago to Evanston and back. However, the night before, a heavy snowfall came up which continued during the following day blanketing the ground with a 10-inch covering. As a result, only six cars essayed the trial, the rest having pulled out because of what were considered impossible driving conditions. Of the six starters, only two finished, with Duryea the winner by a wide margin.

From that time on pneumatic tires grew in demand and gradually replaced solid rubber tires for virtually all types of vehicles. Since then several milestones in tire progress have occurred, including the introduction of cord tires in 1915, the use of carbon black in tread stocks in 1918, the introduction of the balloon tire in 1924, and, more recently, the adaptation of synthetic rubber to passenger car tires.

FIRESTONE REVEALS DATA ON NEW ELECTRONIC PROCESS

Some data on the new electronic rubber curing process that is said to be as much as 17 times faster than the conventional steam method was recently revealed by the Firestone Tire & Rubber Co. Firestone, in conjunction with the B. F. Goodrich Co., recently purchased the basic patents covering this curing method.

The process, which is said to have reached the production stage for the first time, is expected to save thousands of man hours and to increase the output of critical war materials 50 to 80 per cent. These include tank tracks, bogie rollers on which the tracks operate, and rubber wheels for such vital equipment as industrial tractors and hospital carts.

Use of electronics in Army tank track production is scheduled at the Firestone plant in Noblesville, Indiana, while the rubber wheels will be turned out at Fall River, Massachusetts. Electronic equipment also will be used at Fall River in curing foamed sponge rubber for mattresses, upholstery, airplane seat cushions and parachute pads.

Other Uses of Process

Other products which Firestone has cured successfully by processes involving electronics include tires, elastic thread and dozens of other rubber items, as well as brake blocks made of resins and asbestos and many other plastic products.

Electronic equipment heats the entire product almost instantaneously throughout and brings it up to the required temperature in seconds or minutes depending on size and thickness. The product to be heated is placed between two metal plates that are supplied high-frequency alternating current by an electronic generator. (The current used in lighting homes alternates, or changes its direction of flow, 60 times a second, while the electronic generator sends current flowing into and out of the object to be vulcanized 10 to 100 million times a second.)

The company's foamed sponge rubber—Foamex—was cured in 30 minutes by steam and in four minutes by electronics. After it is cured Foamex is dried with hot air. It takes 16 hours to dry foamed sponge rubber with hot air alone, but if it is treated electronically for 30 seconds the drying time is reduced to an hour.

Large hard rubber wheels can be cured in 18 minutes with electronics, but if the job is done with steam it takes five hours. Actually the electronic treatment is applied only two minutes, then the rubber wheel is placed in a steam mold for 18 minutes to finish the cure and give it shape. Brake blocks are cured in seven hours by steam and in 48 minutes by electronic heat.

A 20 per cent saving is achieved in the curing time for garden implement tires and the figure is much greater with larger tires. Elastic thread can be cured electronically in 1½ minutes, while 15 minutes are needed if steam is used. It takes 60 minutes to cure Army tank tracks with steam, but after two minutes of electronic preheating the tracks can be vulcanized by applying steam for only 28 minutes.

Farrel Elects New Officers

At the annual meeting of the board of directors of Farrel-Birmingham Co., Inc., held in Ansonia, Conn., on March 15, Alton Austin Cheney of Plandome, N. Y., was elected chairman of the board, succeeding Franklin Farrel, Jr. Lester D. Chirgwin was elected vice-president in charge of manufacturing, and Franklin Farrel, 3rd, was made secretary and assistant treasurer. Officers re-elected include Franklin R. Hoadley, president; Carl Hitchcock, Armin G. Kessler and Austin Kuhns, vice-presidents; and Frederick M. Drew, Jr., treasurer and assistant secretary.

Oil Well Sealing Compound

A thermosetting resin compound, known as Synvar Oil Well Sealing Compound, which provides a water and oil resistant seal for oil wells, has been developed by the Wilmington Chemical Corp., New York City, in collaboration with the Synvar Corp., Wilmington, Del. It is said that the compound forms an integral and uniform structure with rock formation and pipe, making a more resistant seal than cement, that it can be used at almost any temperature, and that it assures a minimum of shrinkage.

Rehfeld Wins Citation

Harold W. Rehfeld, tire technician of the B. F. Goodrich Co., Akron, has received a personal citation from Secretary of War Henry L. Stimson "for exceptional civilian service" to the war effort. Sent by the War Department as an expert consultant to get tire plants in France and Belgium into operation, early in December, Mr. Rehfeld accomplished what is regarded as "a miracle of tire production." It had been expected that the job would take six months or longer, but by the beginning of March seven tire factories in France and Belgium were in operation. Mr. Rehfeld joined Goodrich in 1929 following his graduation from the University of Minnesota. He has been manager of technical laboratories at the Los Angeles, Calif., plant and factory manager at the Oaks, Penna., tire plant.

Phelps Dodge Builds New Plant

The Phelps Dodge Copper Products Corp., which maintains headquarters in New York, is planning the construction of a new wire and cable plant at Fort Wayne, Ind. The new plant will occupy a 31-acre site, will cost approximately $4,500,000, and will be fully equipped for copper rod rolling and for wire drawing, stranding and insulating on a tonnage basis. To be built without government assistance, it is not being constructed primarily for increased war production and it will form a permanent addition to the company's facilities. About 4,000 will be employed at full production.

While a small tire is being cured by electronics at the Firestone plant in Akron an electronics engineer adjust the controls and an assistant jots down the readings on the various meters of the electronic generator. The aluminum plates used in the process are shown in the cage at the right with the small tire between them.

1943 SURVEY SHOWS RUBBER AMONG SAFEST INDUSTRIES

According to statistics compiled by the National Safety Council, rubber was one of the safest of American industries in 1943. However, safety programs conducted by rubber companies were slightly less effective in 1943 than in 1942. The average frequency rate (the number of reportable injuries per 1,000,000 hours of exposure) was reduced 2% compared with a 5% reduction for all industries, and the severity rate (the number of days lost as the result of reportable injuries per 1,000 man-hours of exposure) increased 7%, whereas the average increase for all industries was only 1%. Both injury rates have increased steadily since 1940. Higher frequency and severity rates for permanent partial disabilities produced the increase in the severity rate.

Within the industry, only the manufacturers of industrial rubber goods reduced both injury rates in comparison with 1942. All other groups had higher rates in 1943. Manufacturers of industrial rubber goods, however, had the highest 1943 frequency rate in the industry, averaging 15.98. The frequency rate of deaths and permanent disabilities was also high, averaging 1.25 in comparison with .65 for all industries. Although the manufacturers of rubber footwear had the lowest 1943 rates, their experience compared with 1942 was least favorable. The average frequency rate increased 36% and the average severity rate was 191% higher than the previous year.

In 1943 the frequency rate of the entire industry was 11.14, which was 23% below the average rate of all industries, and the severity rate was .76, 37% below the general average. Each rate ranked 10th among the corresponding rates of 37 major industries. Higher injury rates in recent years offset the improvement from 1930 to 1936, therefore the net reduction in the frequency rate was only 11%. There was no net change in severity, mostly owing to the industry's experience with serious cases. These results compare with substantial decreases of 45% in both average rates of all industries.

Members of the Rubber Section of the National Safety Council have reported the circumstances and causes of 83 fatalities and permanent partial disabilities. The principal facts regarding these serious accidents are:

(1) Machinery, such as rolls and presses, was involved in almost one-half of the injuries. Other serious accidents involved the use of hoisting equipment, ladders, floors, and other working surfaces. Two-thirds of the accidents were caused by the use of unguarded or inadequately guarded machinery and equipment and poorly maintained or poorly designed equipment.

(2) Closer supervision of employees and further training in safe methods is necessary to reduce accidents substantially. Frequent unsafe practices were the unsafe use of tools and equipment, lifting with the back instead of the legs and other unsafe practices in handling materials, removing, or making safety devices inoperative, and starting, stopping, or operating machinery without authority or getting or giving the proper signals.

(3) Disobedience of instructions, haste, and other improper attitudes were factors in one-half of the accidents. The cause in most of the remaining cases was lack of knowledge, skill, and experience.

Back Copies Wanted

The publishers of RUBBER AGE are interested in securing various back copies needed to fill complete sets. These sets are desired by both domestic and foreign concerns for binding purposes. The following copies are needed: January through September, 1940; January, 1941; May and June, 1941; June, 1943; February, 1944. The publishers will pay 50c for each of these back copies supplied. Please send them to: Circulation Manager, RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Detroit Names Committee Men

The Executive Committee of the Detroit Rubber & Plastics Group, Inc., has announced the following selection of committee chairmen to serve for 1945-46: *Programs,* J. W. Temple (U. S. Rubber); *Publicity,* Dr. C. W. Selheimer (Wayne University); *Membership,* Ed Briske (U. S. Rubber); *Technical Papers,* Earle Sutter (Acushnet Process) and Richard Publow (Essex Wire); *Educational,* Fred Wehmer (Minnesota Mining); *Materials and Standards,* John Freese (Chrysler). In addition, Mr. Wehmer was named counselor and J. P. Wilson (Ford), W. J. McCourtney (Chrysler) and W. J. Phillips (General Motors) were named members of the Advisory Committee. Officers of the group include John Dudley (Chrysler), chairman; R. J. Shroyer (Vanderbilt), vice-chairman; and E. J. Kvet (Baldwin Rubber), secretary.

Oil-Resistant Sheeting

A new type of oil-resistant hospital sheeting has been announced by the Fabrics Division of E. I. du Pont de Nemours & Co., New York City. Coated with neoprene, it withstands oils and sterilization far better than sheeting coated with natural rubber. This addition to hospital sheetings is currently manufactured in 20-gauge, 36-inch width and in maroon color only. Specifications for the material greatly exceed hospital sheeting test requirements of the National Bureau of Standards of the U. S. Department of Commerce.

AGENCY EXECUTIVE OUTLINES POTENTIAL OF FARM MARKET

That the tremendous potential of the farm market in the immediate post-war era is of special interest to the rubber and automobile industries was indicated in a recent address delivered by Dr. Franklin R. Cawl, director of research for Arthur Kudner, Inc., leading advertising agency of New York City, at a meeting of the Farm Marketing Group of the American Marketing Association held in New York.

Pointing out that a general survey of this market marks it as one of the largest single markets in America, with 30,000,000 people living on farms and another 22,000,000 people living in small communities mainly dependent on the farmer for their living, Dr. Cawl stated that farm mechanization is still in its infancy, but growing steadily, and this growth is coupled with a tremendous demand for industrial commodities.

Taking rubber as an example, the agency executive said that from a study made about a year ago it was found that there are more than 300 places where rubber is used on the farm, and many others where it might be used if a little imagination and promotional activity were involved. For instance, he said, the farm is more of a multiple market for tires, batteries, belts, etc., than any urban market, since it utilizes tractors, trucks, passenger cars and implements of various nature. The first three of these use batteries and all four use belts.

Getting down to specific statistics, Dr. Cawl revealed that each year 15,000,000 feet of rubber hose is sold for farm families, and this could be increased very materially "when we know that the 15,000,000 feet was bought by only 5% of the farm homes and that only 25% of the farm homes in the United States have rubber hose." In addition, the farm market currently consumes yearly 1,783,000 pounds of rubber bands, 162,000,000 rubber jar rings, 2,386,000 nipples, 336,000 rubber sheets, 350,000 syringes, 277,000 hot water bottles, 2,505,000 pairs of rubber boots, and 7,830,000 pairs of rubbers.

Referring to a specific product—Pliofilm, made by Goodyear—the Kudner research authority stated that such products have almost unlimited uses after the war. For instance, he said, if applied only to boxed oranges, 10,500,000 pounds of Pliofilm would be used every year; if applied only to boxed apples, 8,000,000 pounds; and if applied only to boxed grapefruit, 6,000,000 pounds. When lemons, tomatoes, cauliflower, asparagus, and even eggs, are added to such products, the quantity soars to figures hard to imagine, according to Dr. Cawl.

Regarding domination of competition, Dr. Cawl stated that no company does anywhere near 20% of the battery business in the farm market and the only brand of passenger car that dominates is the second hand one. This situation, he emphasized, could be changed by the proper approach.

WAR PRODUCTION CONFERENCE HELD IN CHICAGO ON MARCH 29

An all-day War Production Conference, sponsored by the Chicago Technical Societies Council, of which the Chicago Rubber Group is a member, was held at the Stevens Hotel, in Chicago, Ill., on March 29. The Army, Navy, and the War Production Board actively participated in the conference, the purpose of which was the bringing together of executives and technical men connected with the war industries of the Chicago area for the exchange of new ideas and processes helpful to the war effort.

A luncheon address was delivered by Major General Levin H. Campbell, Jr., Chief of Army Ordnance, who spoke on "Building Firepower Through Technology," and Clarence G. Stoll, president of the Western Electric Co., New York, gave a "Battle Front Report" at the conference dinner.

36 Panel Sessions Held

Thirty-six panel sessions were held during the conference, including those on "Synthetic Rubber," sponsored by the Chicago Rubber Group; "Chemistry," by the American Chemical Society; and "Plastics," by the Society of Plastic Engineers. Approximately 200 technical men attended the synthetic rubber panel, which featured the three following technical papers: "Carbon Black and Synthetic Rubber," by Dr. Leonard H. Cohan, director of research, Continental Carbon Co.; "Synthetic Rubber Mechanical Goods," by Leon J. D. Healy, consulting chemist of Milwaukee; and "The Use of Synthetic Rubber in Tire Manufacture," by Robert Dale, chief chemist of the Inland Rubber Corp. B. W. Hubbard, chief chemist of the Ideal Roller and Mfg. Co., presided at the panel.

Speaking on "Carbon Black in Synthetic Rubber," Dr. Cohan stated that the electron microscope and other new techniques indicate that carbon blacks are composed of smooth, non-porous, spherical particles. Although these particles do not break down in rubber, he said, they are themselves composed of much finer crystallites. For synthetic and natural rubbers, the general trends of the physical properties with average particle diameter are very similar.

Recent increases in requirements of carbon black of about 30% make the present supply situation rather unfavorable. However, carbon black production is being increased as rapidly as possible by the construction of new DPC plants. For example, the Witco-Continental group will have a total production on August 1, 1945, of about 300% of the January 1, 1944, production. Owing to the ability of most carbon manufacturers to produce MPC black in about 10% higher yield than EPC black, some relief in the present shortage can be obtained by switching requirements from EPC to MPC. Dr. Cohan presented results showing that a blend of 90% MPC and 10% SRF is equivalent, or even slightly superior, to EPC alone in GR-S.

On the subject of "Synthetic Rubber Mechanical Goods," Mr. Healy presented pertinent data relative to the various types of synthetic rubbers available, stressing physical characteristics and the best types to use for different purposes. Buna S and reclaimed rubber were discussed at some length. The specialty rubbers, including the neoprenes, Butyl, Buna N, and Thiokol, were also discussed, with emphasis again placed upon their physical properties and the relation of the various types to particular purposes.

Speaking on "The Use of Synthetic Rubber in Tire Manufacture," Mr. Dale reported that the need for tires today for both military and civilian use is still so great that the present tire production capacity of the nation is insufficient to meet total demands. The lack of skilled labor, tire producing equipment, and raw material supply, he said, is a triple factor which accounts for this deficiency in production. Because of this limited capacity, provision for increased production is being made by the building of new truck tire producing plants and a corresponding increase in raw materials production capacity, particularly for carbon black and tire cord.

According to Mr. Dale, the ratio of synthetic rubber to crude in military and civilian truck tires has increased over that of last year so that today tires for light truck and passenger use contain only a fraction of 1% natural rubber. Larger size tires, however, still contain a certain amount of natural rubber because of the heavy load and larger size which produces more heat and a corresponding increase in cracking tendency. The natural rubber content per tire for these sizes is approximately 50% less than that used last year, he said, and approximately a 50% greater performance is noted at the same time over that of last year. This increased performance is largely due to the advances made in compounding and polymer research carried out by the government and by private technical groups.

Testing Program Valuable

The testing program being conducted today by both groups is helping to increase the quality of our synthetic rubber tires by decreasing processing time, heat build-up, crack growth and skidding tendencies and by increasing the wearing performance, mileage life and load limit. If the rate of development of synthetic rubber over the last two years is maintained, Mr. Dale predicted, the product resulting in a few years will be superior to that produced in natural rubber days before the war.

Other conference addresses of interest to the rubber industry were "Chemistry of Synthetic Rubbers," by Dr. H. A. Winkelmann, technical director of the Dryden Rubber Co., Chicago, and "Vinyl Plastics vs. Synthetic Rubbers," by T. R. Orme, technical representative of the Bakelite Corp., Chicago.

Ball Joins Midwest Reclaiming

John M. Ball

John M. Ball, who has been associated in various capacities with the R. T. Vanderbilt Co. for the past twenty-four years, has left that organization and has joined the Midwest Rubber Reclaiming Co., of East St. Louis, Ill., as its Eastern representative. Graduated from Cornell University in 1916, Mr. Ball entered the employ of Goodyear in the Akron analytical and research laboratories where he served under C. R. Johnson, W. W. Sanders and C. W. Bedford. At the end of the last war, during which he served in C.W.S., he joined Manhattan Rubber as a compounder, reporting to W. L. Sturtevant. In 1921 he joined Vanderbilt as its second salesman, the first being Gladding Price. After 19 years of travelling in the interests of the company, Mr. Ball was made editor of the *Vanderbilt News*, succeeding Dr. W. F. Russell who assumed direction of chemical research for the company. After editing the 1942 edition of the Vanderbilt Rubber Handbook, he was transferred to WPB in Washington where for 18 months he prepared technical bulletins on the compounding of synthetic rubber, working under the direction of Dr. H. E. Simmons and E. B. Babcock. Returning to Vanderbilt several months ago, he has most recently been engaged in the editing of technical booklets for that company. In his new position, Mr. Ball will call on rubber goods manufacturers in the East and for the time being will maintain headquarters at his home, Millstone Road, Wilton, Conn. He will be directly responsible to G. K. Trimble, Midwest vice-president.

Eagle-Picher Changes Name

Approval of a change in the corporate title of the Eagle-Picher Lead Co., Cincinnati, Ohio, producers of chemical supplies, was given by stockholders at their annual meeting on March 27. In the future the company will be known as the Eagle-Picher Co. No changes in management, personnel, or products are planned.

FIVE NEW RUBBER STANDARDS APPROVED BY ASTM COMMITTEE

Several important new tentative standards and numerous revisions in existing specifications and test methods have been approved in recent weeks by the American Society for Testing Materials on the recommendation of various technical committees. Intensive work in Committee D-11 on Rubber Products and its numerous sub-committees has resulted in five important new standards and revisions in six existing tentative standards. Modified excerpts from the scope clauses of the new items are given below:

Excerpts from Scope Clauses

Specifications for GR-S (Synthetic Rubber) Sheath Compound for Electrical Insulated Cords and Cables: These specifications cover a vulcanized synthetic rubber compound suitable for use as the outside covering, or sheath, on insulated electrical cords and cables which are not subject to severe mechanical use. These requirements cover a lower tensile jacket in relation to the Emergency Specifications for Synthetic Rubber Sheath Compound, much the same as the Specifications D-753 covering Chloroprene Sheath Compound Where Extreme Abrasion Resistance Is Not Required relate to the Specifications for Chloroprene Sheath Compound D-752.

Method of Test for Resistance of Vulcanized Rubber and Synthetic Elastomers to Crack Growth: This method is for use in determining the resistance of compounds of rubber or synthetic elastomers to crack growth when subjected to repeated bend flexing. It is particularly applicable to tests of synthetic rubber compounds which resist the initiation of cracking due to flexing when tested by Method B of the A.S.T.M. Dynamic Fatigue Tests for Rubber Products. Cracking initiated in these materials by small cuts or tears in service may rapidly increase in size and progress to complete failure even though the material is extremely resistant to the original flexing-fatigue cracking. Because of this characteristic of synthetic compounds, particularly those of GR-S, this method in which the specimens are first artificially punctured in the flex area should be used in evaluating the fatigue cracking properties of this class of material.

Method of Test for Hydrogen Permeability of Coated Fabrics: This method is intended for use in the determination of the permeability of hydrogen into air through fabrics coated with rubber or synthetic elastomers. The apparatus used is a fabric permeameter.

Method of Test for Permeability of Rubber or Synthetic Elastomers to Volatile Liquids: This method is used to evaluate the permeability of rubber or synthetic elastomers with respect to volatile liquids diffusing into air. It is applicable only to the materials in sheet form of moderate thickness and is principally useful for comparing the relative permeability of different materials to the same liquid or the diffusion of different liquids through the same material. The method is widely used in connection with airplane fuel cells, gasoline hose, and similar applications.

Methods for Testing Rubber Adhesives: These methods are used in testing the properties of adhesives which may be applied in plastic or fluid form and which are manufactured from natural rubber, reclaimed rubber, synthetic elastomers, or combinations of these materials. They are not all to be considered as applicable to a particular type of adhesive nor do they necessarily include every test which may be applicable to a particular type. They do, however, provide procedures in standard form for evaluating the more important properties of the usual adhesives ordinarily classed as rubber cements. These methods have been under development for several years and should prove very helpful. There have been urgent requests for them from various organizations including branches of the Armed Services.

The tests may be classified in two groups, the first including those procedures in which the adhesive is applied to specimens of materials to be bonded after which the quality of the bond is evaluated, and the second giving those procedures applicable to the adhesive itself without consideration of the bonding properties. The tests in Class 1 are those for adhesion strength, bonding range, softening point and cold flow. Those in Class 2 comprise determinations of viscosity, stability, cold brittleness, weight per gallon, and plastic deformation (for heavy doughs or putties).

Revisions in Tentative Standards

Added to the tests for changes in properties in rubber materials and liquids (D-471) are two additional standard reference fuels for gasoline tests which will meet urgent needs of the automotive and aeronautical industries. Changes in the tests for hard rubber products (D-530) involve the method of sample preparation and the procedure for application of the Rockwell hardness test. Since specifications for hydraulic brake hose require a low temperature bend test, a standardized procedure for this property has been added to the test for hydraulic brake hose (D-571).

In the interest of standardization and to avoid complications in testing sponge rubbers of different apparent densities, the committee is concentrating on the ½ in. slab in the test for cellular rubber products (D-552). Changes in the oven test for aging (D-573) will eventually provide for a temperature of 100° C. for use with synthetic rubber compounds, the lower temperature now in the methods being entirely too slow with various synthetics.

The provisions in the tentative methods for indentation of rubber with the durometer (D-676), which methods have been long and intensively discussed, provide for an amplified scope clause giving a better description of the applicability of the method, a temperature of test is set up for tests at low temperatures, and the time at which the reading shall be taken is also specified. Concerning this latter there have been two fields of thought—whether to use an immediate reading or a delayed reading.

Form Florida Rubber Co.

The Florida Rubber Products Co., which will initially produce rubber soling slabs and later expand into the manufacture of other types of rubber goods, has been organized at 55 Northeast First Street, Miami 32, Florida. George Brumlik and Albert Clark are among the major principals of the new concern, and Michael Levin, formerly connected with the U. S. Rubber Reclaiming Co. and the Midwest Rubber Reclaiming Co., is chief chemist. A new factory is currently under construction and the company hopes to start production by the middle of May. Reclaiming equipment is also being installed, and approximately 20,000 pounds of reclaim will be made daily, all of which will be consumed in the manufacture of the company's products. The pan reclaiming method will be utilized.

Keener Assistant to Collyer

Ward Keener, who joined the B. F. Goodrich Co. in 1937 and has since served in a wide field of activities, has been appointed as assistant to John L. Collyer, president of the company. The position had been assigned to Mr. Keener before Mr. Collyer was named Special Director of Rubber Programs for the Government. Born in Birmingham, Alabama, Mr. Keener graduated from Birmingham Southern College and received his master's degree in business administration at the University of Chicago. His work with Goodrich has included positions as director of business research and assistant to the vice-president for finance.

Organize Goodall Fabrics

The Goodall Decorative Fabrics Division of Goodall-Sanford, Inc., has been consolidated with L. C. Chase & Co., both of New York City, to form a new company to be known as Goodall Fabrics. Paul E. Carr of the Chase company has been appointed general manager, J. E. Williams will be sales manager, and George B. Ogan will serve in a consulting capacity.

Reduce Price of Triton R-100

Price reductions in Triton R-100, the sodium salt of a condensed aryl sulfonic acid, which is used as a dispersing agent for GR-S, have been announced by the Rohm & Haas Co., Philadelphia. The new prices are as follows: 12c per pound in carload lots; 15c in truckload quantities; 15½c in ten drum lots; 16c in less than ten drum lots; and 25c in less than one drum quantities.

BOSTON RUBBER GROUP HEARS TWO TECHNICAL RESIN TALKS

Approximately 340 members and guests attended the Spring Meeting of the Boston Rubber Group, held at the Hotel Vendome in Boston, Mass., on April 6. The program consisted of two technical papers on resins, the first on "The Future of Synthetic Resins," by David S. Plumb, Plastics Division, Monsanto Chemical Co., Springfield, Mass., and the second on "The Application of Resin-Formers to Fibres and Fabrics," by Dr. Donald Powers, Merrimac Division, Monsanto Chemical Co., Everett, Mass. Harry A. Atwater (Hood Rubber), chairman of the group, presided at the meeting.

In his talk, Mr. Plumb stressed the challenge offered to the rubber industry by some of the new synthetic resins. Not only will they open up new markets in fields never entered by rubber, said Mr. Plumb, but they will compete for the consumer's dollar with the older, established products. Choosing four unit operations as examples to demonstrate the availability of new raw materials, *i.e.*, calendering, coating and impregnating of textiles, laminating and extrusion, the speaker discussed each of these operations and the preferred resins for each one. (Editor's Note: Mr. Plumb's paper will be reproduced in full in an early issue of RUBBER AGE).

In the second paper, Dr. Powers stated that by the application of resin-formers to fibres and fabrics the industry is learning how to vulcanize them. He said that just as vulcanization converts rubber from a plastic to an elastic body with greater stability over a wider temperature range, so impregnation with resin-formers gives a textile fabric "memory," slip resistance, shrinkage resistance, and far greater resilience or crush resistance. The resins which are most satisfactory for this so-called "vulcanization" of fabrics, he said, are the resins which are themselves extremely hard and brittle.

Continuing, the speaker stated that the monomers of the hard and brittle resins are soluble in swelling agents for the fibers and make it possible to penetrate the heart or core of the fibers and yarns. After thoroughly swelling the fiber or fabric and penetrating the resin monomer into the yarn, the swelling agent is removed and the resin polymerized. Concentrations of resins as high as 40% may be penetrated into the fiber, according to Dr. Powers, while maintaining softness and resilience. However, 2 to 4% of the same resin deposited on the surface of the fiber gives stiffness and brittleness.

Ontario Meets On April 26

The next meeting of the Ontario Rubber Section will be held in Toronto on April 26. Dr. Howard I. Cramer, director of development, Sharples Chemicals, Inc., Philadelphia, Penna., will be the speaker.

Post-War Model Ebonettes

The Pioneer Rubber Co., Willard, Ohio, has announced that it is now producing its new post-war model Ebonettes, the name given by the company to its neoprene housekeeping gloves. The

new gloves, illustrated herewith, are said to have four improvements which remove practically all criticism women have had of rubber-type household gloves. These are: (1) glove fingers are short so every wearer's fingers fit snug at the tips; (2) curved fingers eliminate glove pull in grasping objects; (3) the hand slips into the new gloves as easily as into a loose cotton glove; and (4) the fingers and thumb have a revolutionary new non-slip finish that actually holds wet slippery objects more firmly than bare hands.

Ontario Section Hears Mark

Approximately 60 members and guests of the Ontario Rubber Section heard Dr. J. G. Mark of the Dewey & Almy Chemical Co., Cambridge, Mass., speak on "Tailor-Made Polymers" at the March 13 meeting in Toronto, Canada. Dr. Mark stated that today polymers are "tailor-made" to fit specific purposes. He outlined the development of plastics and synthetic rubbers and furnished several illustrations of condensation and addition reactions, showing how both types give plastics and synthetic rubbers. A film relating to adhesives for the leather shoe industry was also shown at the meeting. The meeting was preceded by a dinner sponsored by the Chemical Institute of Canada.

Talk Features R. I. Meeting

A talk by J. Burleigh Cheney, president of the Skyway Corporation, on "Taxi Service by Air," featured the meeting of the Rhode Island Rubber Club, held on March 30 at the Crown Hotel in Providence, R. I. James M. Scott, of Scott Testers, Inc., chairman of the group, presided at the meeting. Mr. Cheney's talk centered around his company's post-war plan under which a helicopter taxi service would be offered New England, operating between principal cities. In connection with his talk, the speaker showed a technicolor sound movie of the Bell Helicopter, one of eight such types currently being produced.

BALDWIN-SOUTHWARK DEVELOPS NEW RUBBER MOLDING METHOD

A new method of molding rubber on a small high-speed press, said to be revolutionary in nature, has been announced by the Baldwin-Southwark Division of the Baldwin Locomotive Works, Philadelphia 42, Penna. The announcement was made following successful experiments in conjunction with the Westinghouse Electric & Manufacturing Co., which developed a special electronic heating device.

The new method, which is said to effect a substantial reduction in curing time as compared with conventional equipment, is reported to be an offspring of Baldwin's "Hyspeed" plunger molding press for plastics, announced at the year-end and illustrated and described in the February, 1945, issue of RUBBER AGE.

The additional adaptation of the press for rubber provides economy of operation and maintenance, according to Baldwin officials. The press operates with a smaller number of cavities than are used in conventional rubber molding presses, and yet, due to its high speed, it can produce the same number of products as larger conventional presses; thus there is a savings in molds and maintenance, plus conservation of dies. The new method is capable of molding all kinds of mechanical rubber goods, plumbers' supplies and other items where cavity-molding is needed.

While this new method can be used without preheating of the material, a still further increase in production may be obtained by using electronic radio frequency heating where possible. These radio frequency generators were developed by Westinghouse for use in conjunction with Baldwin's new press.

It is believed that virtually any type of rubber may be handled. Experiments were conducted on some of the new synthetics, such as Buna S, with success. Presses can be furnished with self-contained units or can be arranged for operation with existing accumulator systems. In either case, the press can be fitted with automatic valve operation and timer. Existing molds can be modified to utilize the new method. Standard units will be enclosed in metal casings for neat appearance and plant cleanliness.

Detroit Meets on May 11

The next meeting of the Detroit Rubber & Plastics Group, Inc., will be held at the Detroit-Leland Hotel in Detroit, Mich., on Friday, May 11. A symposium on laboratories, under the title of "Three Modern Rubber Laboratories—A Discussion of Their Most Interesting Equipment," will be held, with talks scheduled by J. W. Schade, director of the Rubber Reserve evaluation laboratory in Akron, Dr. J. N. Street, of the Firestone Tire & Rubber Co., and a representative of the Goodyear Tire & Rubber Co. Each speaker will discuss the latest testing equipment at their respective laboratories, either already installed or planned for early installation.

FINANCIAL NEWS

NEW ISSUES ARE REGISTERED BY GENERAL TIRE & RUBBER

Seventy-five thousand shares of 4¼% $100 par value cumulative preferred stock and 87,857 shares of $5.00 par value common stock, representing new issues, were filed by the General Tire & Rubber Co., Akron, with the Securities and Exchange Commission on March 17.

Of the preferred stock, 65,000 shares are to be offered in exchange, share for share, to holders of the company's outstanding 4½ per cent cumulative preferred stock. The remaining 10,000 shares and unexchanged shares purchased by the underwriters are to be offered to the public at a price not yet determined.

Of the common stock, 22,000 shares are to be offered to certain officers and employees of the company at $10 a share. The remaining 65,857 shares are to be offered for subscription at the rate of one share for eight shares to holders of outstanding common stock at a price not yet set. Unsubscribed shares will be offered to the public at a price to be determined later.

The company said net proceeds from the sale of the preferred stock not issued in exchange for old preferred will be devoted to redemption of old preferred not exchanged. Any balance of these proceeds with proceeds from the sale of common stock, will be added to the general working capital of the company. This will be used, the company said, to retire bank loans in part and to defray the cost of additions and machinery for its plant at Waco, Tex.; about $470,000 at Akron, and about $165,000 at Wabash, Ind.

Any old preferred shares not exchanged will be redeemed, probably in May. Underwriters are headed by Kidder, Peabody & Co., and Goldman, Sachs & Co., of New York, and Ball, Burge & Kraus of Cleveland.

General Cable Corporation

For 1944: Net profit of $2,195,549, after deduction of $11,800,000 for taxes, which compares with $2,078,116 for 1943, when there was a tax deduction of $8,777,000. Current assets as of December 31, 1944, of $33,607,657 and current liabilities of $16,240,677 compare with $28,629,307 and $12,309,883, respectively, for the previous year. According to a statement accompanying the report, the company retired series C bonds in the principal amount of $676,000, making a total of $5,056,000 in principal amount retired since the original $8,500,000 was issued in October, 1940.

Mansfield Tire & Rubber Co.

For 1944: Net income of $641,201, which is equal to $3.88 a common share, including post-war refund, and which compares with $622,864, after renegotiation settlement, or $3.76 a common share, for the previous year. Net sales of $25,076,820 compared with $20,244,463 for 1943.

St. Joseph Lead Company

For 1944: Net income of $5,153,355, after deduction of $2,265,047 for taxes, which is equal to $2.61 a share on 1,975,456 common shares, and which compares with $4,033,974, or $2.06 a share on 1,955,680 shares, for 1943, when there was a tax deduction of $1,690,262.

National Rubber Machinery Co.

For 1944: Net profit of $323,926, which is equal to $2.10 a share, and which compares with $296,841, or $1.92 a share, for the previous year. Profits shown for 1944 are subject to renegotiation, while the figure for 1943 represents profits remaining after settlement.

Garlock Packing Company

For 1944: Net profit of $869,876, which is equal to $4.15 each on 209,250 shares outstanding, and which compares with $999,359 for the preceding year. Working capital as of December 31 was $4,090,914, which compares with $4,177,034 at the end of 1943.

Hewitt Rubber Corporation

For 1944: Net income of $519,985, which is equal to $3.09 a share, and which compares with $559,167, or $3.32 a share, for 1943. Net sales of $15,845,632 compare with $16,591,021 for the previous year.

Belden Manufacturing Co.

For 1944: Net income of $379,083, equal to $1.57 a common share, including post-war refund, which compares with $430,584, or $1.78 a share, for 1943.

Detroit Gasket & Mfg. Co.

For 1944: Net profit of $511,658, which is equal to $2.18 a common share, and which compares with $519,096, or $2.21 a common share, for 1943.

American Hard Rubber Co.

For 1944: Net profit of $246,776, equal to $1.25 a common share, which compares with $228,847, or $1.05 a share, reported for 1943.

Dewey & Almy to Issue Stock

The Dewey & Almy Chemical Co., Cambridge, Mass., has registered with the Securities and Exchange Commission, Philadelphia, 25,000 shares of $4.25 cumulative preferred stock of $100 par value, which will be offered to the public at $102.50 by the underwriters. Of the estimated $2,478,000 net proceeds, $772,500 is to be used for the redemption of the corporation's 15-year 3½% sinking fund debentures, due July 15, 1957, about $1,500,000 will be used for additional manufacturing facilities, and the remainder will be applied to working capital.

Armstrong Plans New Stock

The Armstrong Rubber Co., West Haven, Conn., has entered into an underwriting agreement with the F. Eberstadt Co. covering the sale of 40,000 shares of $50 par value, 4¾% cumulative convertible preferred stock and 50,000 shares of $5 par value Class A common stock. It is planned that the present Class A stock will be split four for one.

Intercontinental Rubber Co.

For 1944: Net income of $355,374 on sales of $3,072,592, which compares with a 1943 net income of $595,523 on sales of $3,498,571.

Seek Safety Information

The Rubber Section of the National Safety Council has undertaken the formulation of safe practices pamphlets on rubber mills, calenders, Banbury mixers, strainers, plasticators, pelletizers, tubing machines, etc., and is seeking information from rubber manufacturers on devices for overcoming the hazards involved in operating these machines. The Section is particularly interested in the location of special trip bars and cords on mills and calenders, and in any special circuits which are used; also in guards at calender rolls on both the rubber and fabric feed sides. Pictures, sketches and prints which will clarify descriptions are requested. Information should be submitted to Thomas H. Boyd, c/o Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., 61 Willet St., Passaic, N. J.

Details of Whippany Sale

Sumner Simpson, president of Raybestos-Manhattan, Inc., informed company stockholders at their annual meeting held on April 3 that in return for the plant at Whippany, N. J., recently sold to the Flintkote Co., Raybestos-Manhattan will receive 19,513 shares of Flintkote common stock. He also revealed that the company's Manhattan Rubber Manufacturing Division will transfer some of its reclaimed rubber operations from Whippany to the Passaic, N. J., plant, although some reclaim will be purchased from Flintkote.

Allen Named General Manager

Robert G. Allen

Robert G. Allen, formerly president of the Duff-Norton Manufacturing Co., Pittsburgh, Penna., has been appointed general manager of the Baldwin Southwark Division of the Baldwin Locomotive Works, Philadelphia, succeeding Frederick G. Schranz, who has resigned effective April 30. Mr. Allen was born in Winchester, Mass., and attended Phillips Andover Academy and Harvard University. In 1925 he became associated with the Walworth Company, of which he became divisional sales manager in 1929. From 1936 to 1940 he served two terms as a Representative from the 28th Pennsylvania District in Congress. In 1940 Mr. Allen was elected president of the Duff-Norton Manufacturing Co. In July, 1942, he entered the Army Ordnance Department as a major, and in February, 1943, he was promoted to the rank of lieutenant colonel. Returning from overseas service in November, 1944, he was placed on the inactive list in January, 1945.

Cancel A.C.S. Fall Meeting

The request of the American Chemical Society to hold its regular Fall meeting has been denied by the War Committee on Conventions. The meeting was scheduled to be held in Chicago from September 9 to 14. The Spring meeting of the society was also cancelled. It is presumed that the Fall meeting of the Rubber Division will also be called off, although no definite date had been set for any such meeting.

Metallurgical Service Expands

The Metallurgical Service Co., 1020 E. Michigan St., Indianapolis 2, Ind., which offers a special rubber-denuding service to industry, has purchased 65,000 square feet of ground for the erection of buildings to care for expanded operations.

New Plastic Protective Film

The Standard Varnish Works, Staten Island, N. Y., has developed a new plastic strip coating, called Plasto-Pak, which is designed to prevent corrosion, tarnishing, scratching or soiling of metals during production, assembly, shipping or storage. Plasto-Pak is an air-drying plastic polymer in solution form for dip or spray application at room temperature, at which it dries in from 5 to 10 minutes. When articles which have been treated with this solution are ready to be used or exhibited, the coating can readily be stripped from them. It is said that Plasto-Pak meets all requirements of AAF Specification No. 14130, and that Type A-20 has gained the approval of the Signal Corps for use in the packaging of equipment.

Fuel Tanks in Tokyo Raid

The Glenn L. Martin Co., Baltimore, Md., has revealed that its Mareng fuel tanks provided the added cruising range which made possible the sensational Doolittle raid over Tokyo in April, 1942. These flexible, fluid-tight cells, of the non-self-sealing type, constructed of synthetic rubber-coated fabric, were specially designed by company engineers to fit into a specified cavity in the fuselage of a Mitchell bomber. Through the use of these cells, an extra 163 gallons of high octane gas were carried, and an extra 500 miles was added to the cruising range of the raiding planes. Since the planes actually took off several hundred miles farther out at sea than had been planned, it was the fuel cells that provided the extra needed margin of safety.

Synthetic Latex Production

Production of special synthetic rubber latex now exceeds 1,500,000 pounds per month and is expected to reach 2,000,000 pounds per month, dry weight, before the end of the year at the Naugatuck, Conn., government plant operated by the U. S. Rubber Co., according to J. P. Coe, general manager of the company's Synthetic Rubber Division. This production compares with a total of approximately 10,000,000 pounds for the past year at the Naugatuck plant, and with a nationwide consumption of 6,000,000 pounds of natural rubber latex per month just before the war.

New Chemical Firm

Two affiliates of the American Home Products Corp.—Harmon Color Works, Inc., Haledon, N. J., and Marietta Dyestuffs Co., Marietta, Ohio—have been merged to form Marietta-Harmon Chemicals, Inc. No changes in management, personnel, or plant locations are contemplated. Ranking officers of the new company are George A. LaVallee, chairman of the board; Victor J. Chartrand, president; V. C. Vesce, vice-president and technical director, and W. R. McAdow, sales director.

Russian Insulating Material

A high-frequency cable designed in Russia, which is reported to compare favorably with imported cables, although the raw material from which it is made is both cheaper and more accessible, is of considerable interest, according to the Soviet press, as reported to the Bureau of Foreign & Domestic Commerce at Washington, D. C. A new, hard, insulating material, "escapon," which is used in the manufacture of the cable, was developed by the Leningrad Physio-Technical Institute in its study of the electrical properties of plastic materials. In the production of escapon, ordinary synthetic rubber is heated and "the spatial polymerization process" which takes place is described as the combination of the long molecules of the rubber with one another in diagonal fashion, causing the rubber to harden in a substance similar to ebonite. The Institute is working now on the use of escapon in a new design for a feeder for high-frequency equipment, in the manufacture of which an imported material, known as "politen," was used.

U. S. Rubber Promotes Cadwell

Sidney M. Cadwell

Dr. Sidney M. Cadwell, director of tire development of the U. S. Rubber Co. for the past several years, has been appointed an assistant general manager of the company's tire division. In his new post, Dr. Cadwell will continue to make his headquarters at Detroit, Mich. He will be responsible for production, development and engineering of the tire division, while Howard N. Hawkes continues as assistant general manager in New York in charge of all sales activities. Dr. Cadwell received his Ph.D. from the University of Chicago in 1917. Credited with many developments in synthetics and tires, he is regarded as one of the country's leading rubber chemists. He has served as chairman of the Rubber Division and the Detroit section of the A. C. S. and as president of the Tire and Rim Association.

NAMES IN THE NEWS

L. A. McQueen, vice-president in charge of sales, and S. S. Poor, vice-president in charge of retail merchandising, both of the General Tire & Rubber Co., Akron, have been elected directors of the company.

Dr. Ralph C. Swann, who has been associated with the petroleum industry as a research chemist, has been appointed director of research of the American Mineral Spirits Co., Chicago, Ill. He is a graduate of M.I.T.

Corporal Harry V. Brediger, son of Victor M. Brediger, president of the Chardon Rubber Co., Chardon, Ohio, died on Leyte Island, in the Philippines, on February 15.

Dr. C. H. Greenewalt, formerly technical director of the Explosives Department of E. I. du Pont de Nemours & Co., has been appointed assistant director of the company's Development Department.

John L. Cohill, vice-president of the Firestone Aircraft Co., Akron, since September, 1942, has been promoted to the presidency of the company. D. W. Anderson, who has been associated with the sales and engineering departments of various Firestone divisions for eleven years, succeeds Mr. Cohill as vice-president.

E. A. Powell, assistant superintendent of Goodyear Clearwater Mills, Rockmart, Ga., since 1929, has been made superintendent of the plant, succeeding L. S. Hall, who has retired after twenty-five years of service.

Dr. J. R. Van Pelt, Jr., until recently technical director of the Museum of Science and Industry, Chicago, Ill., has joined the staff of Battelle Memorial Institute, Columbus, Ohio, as head of its program of scientific research education.

Glenn P. Smith, formerly with the Synthetic Rubber Division of the U. S. Rubber Co., is now associated with the Atlantic Tubing & Rubber Co., Cranston, R. I., as a project engineer.

Glenn E. King, until recently director of research for the Johnson Rubber Co., Middlefield, Ohio, is now chief chemist of the Barringham Rubber Co., Ltd., Oakville, Ontario, Canada.

Robert S. Wilson, vice-president of the Goodyear Tire & Rubber Co., has been named a representative of the Citizens Federal Committee on Education by the National Association of Manufacturers.

Gardiner Hawkins, formerly vice-president of Deering Milliken & Co., Inc., has resigned to become executive director and treasurer of The Rayon Producers Group following completion of his present activities as price executive of the Textile Branch of OPA in Washington, D. C.

Dr. W. B. Pings, who has been connected with the Experimental Station of E. I. du Pont de Nemours & Co., Wilmington, Del., as an organic chemist, has joined the staff of Arthur D. Little, Inc., Cambridge, Mass.

Dean E. Carson, who has been associated with the B. F. Goodrich Co., Akron, since 1930, has been appointed director of business research of the company, succeeding Ward Keener, who has been made assistant to the president of the firm.

L. M. Seiberling, who has been connected with the Seiberling Rubber Co., Akron, for 18 years, most recently as assistant sales manager in charge of manufacturers' and government sales, has been appointed sales manager of the company.

J. R. Sweetman, who was recently appointed chief chemist of the Beacon, N. Y., plant of the New York Rubber Corp., has left that organization and has resumed operation of Sweetman's Laboratories, Morristown, N. J., which offers a consulting service to the rubber and plastics industries.

Harvey S. Firestone, Jr., president of the Firestone Tire & Rubber Co., Akron, has been appointed a member of the advisory committee of the United Negro College Fund, which will seek $1,550,000 for the war needs of 32 negro colleges.

John W. Osbon, controller of the Pennsylvania Rubber Co., Jeannette, Penna., and Elmer H. Paradies, control manager of the U. S. Rubber Co., Los Angeles, Calif., have been elected to membership in the Controllers Institute of America.

Eric C. Gyllensvard, export manager of the Sullivan Machinery Co., Michigan City, Ind., since 1937, has been appointed export sales manager of the Farrel-Birmingham Co., Inc., Ansonia, Conn.

C. S. Gischel, who has been associated with the Firestone Tire & Rubber Co., Akron, for 10 years, has been appointed manager of the firm's newly-created aircraft tire and accessory sales department.

Davis Named Vice-President

Sam A. Davis

Sam A. Davis, who joined the C. P. Hall Co., Akron, in 1923, has been appointed vice-president and general manager of the C. P. Hall Co. of Illinois. He will be in charge of the company's Chicago offices and of the new Chicago plant which is to be opened shortly. Mr. Davis was promoted from clerk to sales representative in 1936, when he moved to Chicago. His present address is 7342 South Shore Drive, Chicago, Ill.

J. F. McWhorter, research chemist of the Ohio Rubber Co., Willoughby, Ohio, has been appointed to the mechanical rubber goods consulting committee of the WPB Rubber Bureau.

David Levinger, vice-president of the Western Electric Co. since April, 1942, and manager of its Hawthorne Works, Chicago, Ill., is currently celebrating his thirty-fifth year of service with the company.

Joseph S. Cornell, vice-president of M. Barbanell, Inc., New York City, dealers in crude rubber, synthetics, latex, balatas, and guayule, has been elected president of the company, succeeding the late Morris Barbanell.

W. E. Clark, who has been connected with the U. S. Rubber Co. since 1931, most recently as production assistant to the general manager of the Textile Division, has been promoted to assistant general manager of that division.

E. J. Thomas, president of Goodyear Tire & Rubber Co., Akron, has been appointed to the recently-formed National Labor-Management Post-war Cooperation Committee.

Mrs Carroll J. Mayle, wife of C. J. Mayle, secretary of the Fremont Tool & Die Co., Fremont, Ohio, died on March 7.

ORDNANCE TIRE REPAIR CO. OPERATING UNITS IN ITALY

An Ordnance Tire Repair Company in Italy is operating what is believed to be the largest tire repair shop overseas, according to a statement recently issued by the War Department. Commanded by Capt. M. L. Shreves, this company turns out an average of 534 tires a day during an average 30-day operating period. Some of the tires receive three separate operations. In 24 actual operating days, 12,806 tires were completed. One repiared tire rolls off the assembly line every two minutes and 15 seconds of operating time.

During the present critical tire shortage, the value of the work being done by this company is immeasurable. Many trucks used for the transportation of vital supplies to the Italian front are now using recapped tires. Many low-lift machines, which are used in unloading ships and placing items in depots, were deadlined for lack of tires until the company started repairing the size which they use. Roadgrading machines depend entirely on repaired tires.

The company personnel consists of 5 officers and 140 enlisted men. An average of 145 Italian civilians and 60 Italian soldiers are employed each day. Most of the Italian civilians were originally local farmers. The following figures are an extract from the operation records of the company during a 30-day month, with 24 actual operating days:

Tires completed	12,806
Tubes repaired	9,984
Tires inspected & classified	30,673
Tires shipped	60,186

The tire shop was opened at its present location in July, 1944. Floor space under roof was 15,960 square feet. The first repaired tire was finished on July 7. This tire has been retained by the company and is called the "Two Million Dollar Tire." It is estimated that the cost of the machinery, the training of the personnel and the cost of moving personnel and machinery would amount to practically that figure. In addition to the "Two Million Dollar Tire," 156 additional tires were repaired on that first day of operation. Waiting to be repaired at that time were approximately 65,000 tires of all sizes.

During the month of July, 5154 tires were completed. The shop was being run on a 24-hour schedule and production was increasing as the Italians began to learn their duties more thoroughly. It requires approximately two weeks to train an unskilled civilian in the performance of a repair operation.

In August, production increased to 11,190 tires completed, many of which required three separate repair operations, such as spot, section or reinforcement repairs, before a full recap could be applied. It is estimated that if each tire required only one repair operation, the shop could turn out 1,200 tires a day.

In September, the shop only operated seven days due to lack of material. During this period of waiting, the company took over the operation of the compound where tires waiting to be repaired are stored. There were 105,119 tires in the compound on that date. Materials arrived during the first days of October and production was resumed on October 4. Nine thousand tires were repaired in the remaining days of that month.

Production since that time has been uninterrupted. Production data for the period July 7 to December 14 reveals that 48,769 tires were completed, requiring more than 80,000 operations, and that 6,474 units were retreaded.

Story of Initiative

According to a report in a recent issue of the *New York Times* lack of rubber inactivated many trucks and other vehicles on a small but important island in the Southwest Pacific in 1943, and Army Ordnance men determined to make their own tires. They secured molds from Australia, obtained a boiler from an abandoned Chinese gold mine, flew in rubber and other materials. Two soldiers in the hospital, who had worked in Akron tire factories, drew up hasty blueprints by sketches, the "factory" was thrown together rapidly, and the resulting tires put more than 400 stranded trucks back into action.

New General Purpose Oil

A new oil, called No. 220 Oil, specifically developed for use in the reclaiming of scrap rubber, but which finds general application in compounding rubber stocks, has been introduced by the Gilbert Research Institute, Morristown, N. J. The manufacturers claim that use of No. 220 Oil in reclaiming processes eliminates the necessity for destroying the fabric in the scrap by means of acids or alkalies, since addition of the oil to the scrap in a mixer results in the fabric being reduced to a powdery state after the devulcanization process and once the reclaim is passed several times through a tight mill the fabric disappears and refines with but little tailings. Reclaims made by this method are said to be more compatible with such synthetic rubbers as GR-S, GR-M and GR-N. When 1 to 2% of No. 220 Oil is compounded with an alkali reclaim, it softens the reclaim on the mill and helps to smooth out the stock so that it calenders more easily. The new oil is also reported to act as an efficient plasticizer for Hycar and other synthetics and to be useful in the compounding of the vinyl polymers. The oil has a slightly objectionable odor which can be reduced by the addition of pine tar or other materials.

WPB OFFICE OF RESEARCH ISSUES REPORT ON PROJECTS

Research projects that have been coordinated and expedited by the Office of Production Research and Development of the War Production Board in the last year have made important contributions to increased war production, according to a report issued by WPB on February 15. Projects sponsored by this Office are said to have developed successful substitutes for rubber, adhesives, tin, light metal alloys, wood pulp and ship timbers.

As the technical research agency for WPB, the Office of Production Research and Development does not itself carry out the research and tests, but evaluates, initiates, finances and coordinates practical wartime research projects, many of which will have lasting post-war applications. The actual research work has been and is being done by academic and industrial research groups employing thousands of experts. In those instances where the research is not of immediate commercial value, but is necessary to the prosecution of the war, OPRD has supplied the necessary funds.

According to Donald B. Keyes, director of OPRD, the importance of the Office's work is measurable not by the amount of research expenditures, but by its effect in increasing and expanding war production. For example, $200,000 was spent for research on one war project, with the result that industry and other government agencies invested an additional $50,000,000 and the project was brought to a successful conclusion months earlier than otherwise would have been possible.

Among projects being carried on by OPRD at present are processes for the efficient production of vinyl pyridine rubber, which appears to exhibit better properties for tire construction than the present standard Buna S, and of channel carbon black for tires. It is also concerned with the problems of suitable processing of raw materials needed for the production of vinyl pyridine rubber.

Two projects of interest to the rubber industry which OPRD has completed are a rubberless adhesive material for making industrial tapes, especially those needed by the Armed Services, and a gasket-making machine which has been perfected to the point where it can produce 40 gaskets per minute. The latter machine was recently turned over to the Quartermaster General for his guidance in the procurement of round section gaskets, largely used in military gasoline tanks.

Hercules Powder Co., Wilmington, has purchased a twin-engined, low-winged Beechcraft passenger monoplane for the use of its executives travelling on war work. The plane was purchased through the U. S. Army and will be used largely by executives of the company's explosives department.

LOS ANGELES NEWS

The scheduled St. Patrick's Day Golf Tournament of the Los Angeles Rubber Group, Inc., was held on Saturday, March 31, with twenty-six members and guests participating and with sixteen prizes being distributed for various events. Although scheduled to be held on March 17, the tournament was postponed until March 31 because of a "high fog" which marked St. Patrick's Day. First place among the rubber men went to Miles Reinke (Reinke, Hiller & Amende), but he was nosed out by a narrow margin for first place in the tournament by one of the guests. The tournament was held at the California Golf and Country Club. Prizes were contributed by Bob Abbott (C. P. Hall), Vic Vodra (Vanderbilt), Ed Royal (H. M. Royal), and Lou Konig (Wesp, Meldowney & Martin).

Al Hill, a member of the Los Angeles Rubber Group and editor of the *Commercial News and the Daily Shipping Guide*, has taken on the job of publishing a book written by Clarence S. Matson and bearing the title, "Building a World Gateway." The book is the detailed story of the building of Los Angeles harbor, the author until his recent death having been manager of the World Trade Department of the Los Angeles Chamber of Commerce. The book contains 256 pages and is replete with illustrations showing the harbor in various stages of development over a long period of years. Los Angeles harbor is a man-made harbor, a large area of mud flats having been channeled for deep water, and a break-water many miles long having been built to give an area of still water well above 20,000 acres in extent. There have been years when the tonnage passing through this man-made harbor ranked second only to that of New York.

E. F. Tomlinson, general sales manager of the Industrial Products Division, B. F. Goodrich Company, was a recent business visitor in Los Angeles. Coming to the city at the same time from headquarters were the following men: F. A. Lang, P. W. Van Orden, Jay E. Miller, H. F. Mosher and H. C. Klein. The theme under discussion was post-war planning. In the city also to meet with this group were H. A. Schulz, district manager of the Industrial Products Division at San Francisco and F. D. Rainyard, district manager at Seattle. Lee Horchitz is Los Angeles district manager and he acted as host to the group.

Mrs. Ruth Scofield Perkins, who for several years was associated with the Voit Rubber Corporation and later with the Union Rubber Company, died recently.

James B. Bennett, 56, for the past four years connected with the Grizzly Manufacturing Company as factory manager, died suddenly on March 11. Mr. Bennett had been associated with the

Top (left): In attendance at the April 3 meeting of the Los Angeles Rubber Group were, left to right, Walter Head (Goodrich), Frank Steele (Goodyear), F. H. Banbury (Farrel-Birmingham), and W. D. Pardoe (Thermoid).

Top (right): Participating in the golf tournament held on March 31 were, left to right, C. R. Wolter (U. S. Rubber), Miles Reinke (Reinke, Hiller & Amende), Tommy Tomkins (U. S. Rubber), and Ed Royal (H. M. Royal).

Left: Lester Cox (Thermoid) takes a swing at the ball at the tournament as B. R. Snyder (Voit), George Steinbach (H. M. Royal), and C. L. Came (Resinous Products) look on. C. R. Wolter and Ed Royal are in the background.

rubber industry for the last seventeen years. He was very active in Masonic circles and in other social and welfare activities.

The Goodyear Tire and Rubber Company has raised the maximum suggestion award from $500 to $1,500, the most liberal award offered since the suggestion system was inaugurated.

Al Heaman, who had been employed by Goodyear for nineteen years, in recent years in connection with the stationery store room, died recently. Word also has been received from Akron that Ned Cadot, who was personnel manager at the plant prior to the time when Tom Mick took over that job, passed away recently. He had been with the company for seventeen years and had been engaged in various phases of personnel work.

J. M. Miller, factory manager of the Los Angeles plant of the U. S. Rubber Company, has received word confirming the death of his son, Lieutenant John M. Miller, 20, pilot of a B-17, who was shot down over Merseburg, Germany, on November 25, 1944. The young man was reported missing in action at that time but his death was not confirmed until very recently. Lieutenant Miller was on his fifteenth mission when shot down. He entered the service in March, 1943.

N. J. Hooper, vice-president in charge of sales for Sharples Chemicals, Inc., Philadelphia, spent some time in Los Angeles during the month, leaving for Philadelphia on Saturday, April 7. During his stay he was accompanied on his calls by Monty Montgomery, who is in charge of local distribution.

The Typrene Roller Company, headed by Clark Tyler, is one of those numerous rubber factories that has constantly to be extending its space and equipment. A heavy demand for coating of rollers in the aircraft field has added to the original main business, that of manufacturing printers' rollers. T. A. Thistle is the outside man.

F. H. Banbury, of the Farrel-Birmingham Company, Ansonia, Connecticut, who has been spending several months in the warm and invigorating southern California climate, was slated to leave for his home in the East on Monday, April 2. Mr. Banbury, an enthusiastic member of the Los Angeles Rubber Group, spends all of his winters in California.

Joseph P. Jordan, formerly sales correspondent for the B. F. Goodrich Company, Industrial Products Division, now serving in the armed forces overseas, and now carrying the rank of sergeant, recently was awarded the silver star for bravery in action. The citation was awarded following an act of heroism which probably saved an American platoon from near destruction.

The new 1945 Yearbook of the Los Angeles Rubber Group, Inc., was distributed at the last meeting of that group. Bound in leatherette and well supplied with illustrations, the book presents a history of the group for the past year and includes a good deal of detailed technical information of value to rubber technologists. The amount of advertising is larger than in the previous edition. Leaders in the job of getting the book out were Charles H. Churchill (B. F. Dougherty), Walter Boswell (Thiokol), and D. C. Maddy (Hycar). The book consists of 48 pages and cover, plus a few membership application blanks.

Sergeant Charles Hutchinson, son of R. E. Hutchinson, chairman of the Los Angeles Rubber Group, spent a number of days at home late in March and early in April after having spent a year in Alaska in the Army Air Corps as a weather observer. Young Hutchinson has been in the service about 30 months. He was slated to go from Los Angeles to Great Falls, Montana, where he was to stay for a few weeks before going back to Alaska.

The Oliver Tire and Rubber Company, Oakland, has completed a new factory home, a fireproof building with complete first floor and a second floor of smaller area than the first. This greatly increases the floor space occupied. Visiting Los Angeles and attending the April Rubber Group meeting were Russell D. Kettering, chief chemist, and W. E. Winterbourne, chief development engineer.

W. D. Pardoe, vice-president and general manager of the Thermoid Company, Trenton, N. J., has been spending several weeks in Los Angeles acting as manager of the plant which the company has acquired there. This plant, formerly operated by the Grizzly Manufacturing Company, will in the future be operated by the Grizzly Division of the Thermoid Company of California.

Miles Reinke spent some time in San Francisco recently, where he took charge of the office of his company (Reinke, Hiller and Amende) during the absence of Herb Munger who was in Denver on official business.

Rubber Conservation Aided

The cause of rubber conservation at the Mobile Air Technical Service Command, Brookley Field, Alabama, has been aided by the development of a mold which permits the vulcanizing of rubber stems torn from airplane de-icing boots. The mold, which brought its inventor an AAF Award of Merit Certificate and a check for $250.00, is of cold-rolled steel, approximately 6 x 6 x 2 inches. Officials point out that the invention has permitted the restoration annually of de-icer boots worth $30,000 to date.

DISNEY ARTISTS ENTERTAIN LOS ANGELES RUBBER GROUP

Two artists from the famous Walt Disney Studios were featured at the regular monthly supper meeting of the Los Angeles Rubber Group, Inc., held at the Mayfair Hotel, in Los Angeles, on April 3. In addition, a humorous talk was given by Loyd Prante, noted author and humorist.

The two Disney artists were Dick Mitchell and Clarence "Ducky" Nash, the voice of the irresistible Donald Duck character. Mr. Mitchell drew pictures of various Disney characters with crayons and indicated how drawings are speedily produced. Mr. Nash is also a ventriloquist and held a long conversation with a model of Donald Duck. A good imitator of birds, from eagles to mocking birds, he also performed numerous imitations of this type. Mr. Prante delivered one of his celebrated "homely philosophy" talks.

During the brief business session the new 1945 Yearbook was distributed. A report on the golf tournament (details of which appear elsewhere in this issue) was made by Al Pickard. Door prize for the evening, a $25.00 War Bond donated by the Miller Gasket Co., was won by Lim Sing Ye. Other prizes and winners included the following: Pressure cooker, by Olds Alloy Co., won by George J. Aballi (Braun Corp.); traveling case, by Union Oil Co. through R. A. Carlson, won by J. A. McClinton; brief case, by Thiokol Corp., through Walter Boswell, won by Leroy Ketler; carving set, world atlas and phone index, by Monty Montgomery, won by Ed Lewis (Western Insulated Wire), Andy Matelik (Sierra Rubber), and Craig S. McCormick (Plant Rubber & Asbestos), respectively.

At the meeting of the technical group, which precedes the supper meeting each month, approximately 50 members and guests heard an address on "Some Latest Ideas Concerning the Operation of Banbury Mixers," delivered by F. H. Banbury, inventor of the celebrated mixer. Mr. Banbury discussed some of the new developments in both the manufacture and use of the Banburys, using charts to illustrate his talk. He went into considerable detail on the development of the mixer and also discussed operational mechanics. An open forum followed the talk.

Opens New England Office

The opening of a New England sales office in the Chamber of Commerce Building, Boston, Mass., has been announced by the Standard Chemical Co., of Akron, Ohio. The telephone number is HANcock 0300. C. A. Meyer, for many years associated with the Barrett Division of the Allied Chemical & Dye Corp., has been named manager of the new office. Complete warehouse stocks of Standard chemicals and compounding materials are carried in Boston.

Form Goodrich Chemical Co.

Establishment of the B. F. Goodrich Chemical Co., with offices and laboratories in Cleveland, Ohio, has been announced by Goodrich. The new company, which will operate as a division of the parent concern, will take over the activities of the Goodrich Chemical Division, and will continue the manufacture and sale of Geon vinyl resins, chemicals and reclaimed rubber. William S. Richardson, who has been with Goodrich since 1926 and who is a vice-president of the Hycar Chemical Co., jointly owned by Goodrich and Phillips Petroleum, has been named president of the new chemical company.

Wm. S. Richardson
heads Goodrich Chemical Co.

Akron to Meet May 11

The Annual Spring Meeting of the Akron Rubber Group, which will feature the election of new officers, will be held at the Mayflower Hotel, in Akron, on Friday, May 11. Because it appears that it will again be impractical to hold a summer outing this year, a cocktail party, similar to the one held last year, will be arranged for the meeting. If finances permit, entertainment will be furnished in addition to guest prizes. Jack R. Moore, of the Standard Chemical Co., Akron 8, Ohio, is secretary-treasurer of the group.

Wilmington Offers Synvar Resins

Collaborating with the Synvar Corp., Wilmington, Del., the Wilmington Chemical Corp., New York, is now offering a complete line of urea formaldehyde and phenol formaldehyde resins, as well as specially-developed plastics for the rubber and allied industries. Thermoplastic type resins will also be available in the near future.

Surplus Sales

The sale of consumers goods during the months of December, 1944, and January, 1945, reported by the Office of Surplus Property of the Treasury Department included $40,841 worth of tires to Goodrich, $13,725 to Armstrong Rubber, $54,790 to Firestone, and $13,242 to Seiberling Rubber. Innersoles valued at $9,395 went to U. S. Rubber and $10,342 worth of cable wrapping rubber tape to the Perry Schultz Co. of Los Angeles. Considerable quantities of life rafts were also sold in the two-month period.

Changes Made at Detroit

Dr. Sidney M. Cadwell, recently-appointed assistant general manager of the Tire Division of the U. S. Rubber Co., as reported elsewhere in this issue, has announced the appointment of Luther B. Martin as director of tire development and research and that of Dr. Arthur W. Bull as associate director of tire development. Both are stationed at the Detroit, Mich., plant. A native of South Carolina, Mr. Martin was graduated from Clemson College in 1906 and from the National Law School in 1910. He joined U. S. Rubber in April, 1918, as a chemist at the Hartford Rubber Works, Hartford, Conn., later becoming chief chemist and eventually factory manager. He was transferred to Detroit in 1929 as manager of tire quality. Dr. Bull is a native of New York. He graduated from Cornell in 1919 and joined the company in 1928 at the General Laboratories in Passaic, N. J., later being transferred to the tire development department at Detroit. In recent years he has served as manager of tire engineering.

Organize Thermoid Mould Works

The Joseph Stokes Rubber Co., Welland, Ontario, Canada, has announced the organization of a new affiliate, the Thermoid Mould and Tool Works, Ltd., Welland. Vernon Kessig, formerly supervisor of molds, tools and dies of the parent company, has been appointed vice-president and general manager. The new company will specialize in the design and manufacture of molds and tools for the rubber and plastics industries. The Joseph Stokes Rubber Co. is controlled by the Thermoid Co., Trenton, N. J.

CHARLES A. NORRIS, chief engineer of phenolic molding materials for the Bakelite Corp., New York, for the past two years, has been named assistant general sales manager of the Thermosetting Plastics Department of the company.

Stanco Opens Chicago Office

Stanco Distributors, Inc., has opened a branch office at 75 East Wacker Drive, Chicago 1, Ill. The new office will be in charge of W. H. Peterson, who will cover Illinois, Indiana, Missouri and the surrounding territory. Mr. Peterson joined Stanco Distributors in December, 1943, after serving for some time with the former Office of the Rubber Director at Washington. Prior to his government work he was associated with Haartz-Mason-Grower Co. in Watertown, Mass. Mr. Peterson has had wide experience in the application of synthetics.

W. H. Peterson
heads Stanco Chicago office.

Organize Furane Plastics Co.

Organization of the Furane Plastics and Chemical Co., with headquarters at 5233 West San Fernando Road, Los Angeles 26, Calif., has been announced. For the present the new company is devoting its attention to the preparation of high strength, cold setting adhesives for plastics and rubber products, but in the near future it expects to produce a new liquid thermosetting casting resin which is activated by mild alkaline catalysts and can be cured at relatively low temperatures. John Delmonte, technical director of the Plastics Industries Technical Institute, will serve as company consultant.

Thermoid Acquires Grizzly Plant

Negotiations have been completed under which the Thermoid Co., of Trenton, N. J., has acquired the Los Angeles plant of the Grizzly Manufacturing Co., along with the complete line of Grizzly oil field, industrial and aviation products and the patents covering such products. Thermoid will continue to operate the Los Angeles plant, while Grizzly will continue the manufacture of its automotive friction products at its Paulding, Ohio, plant.

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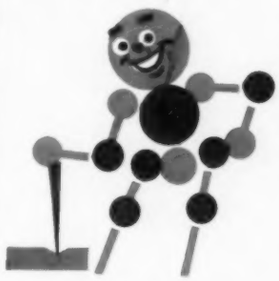

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Typical Results Under Controlled Conditions

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Zinc Oxide		5.0
Stearic Acid		1.0
Trimethyl dihydroquinoline type antioxidant*		3.0
Dibenzyl Sebacate		10.0
Protective Wax**		2.5
Semi Reinforcing Furnace Black		50.0
Tetra Methyl Thiuram Disulfide		3.0
Mercaptobenzothiazole		3.0
Original Physical Properties Cured 45 minutes at 287° F.		
Tensile psi		1870
Elongation at break percent		930
Shore Durometer hardness		51
Compression Set ASTM 30% Constant Deflection		
70 hours at 212° F.		32%
70 hours at 250° F.		43%
Oven Aging 70 hours at	250° F.	300° F.
Tensile psi	2055	1300
Elongation at break percent	520	110
Shore Durometer Points change	+4	+10
Heat Loss percent	2.9	4.4
180° Bend Test	no cracking	no cracking
Low Temperature Properties		
SAE-ASTM Low Temperature Bend Test 5 hours in Cold Air.	O.K. at —60° F.	

*Agerite Resin D; Santoflex B

**Sun Proof; Heliozone; Antisol

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THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

CANADIAN NEWS

The fabric situation for tires is far more serious than the synthetic rubber supply, according to a statement issued in Montreal on March 30 by R. J. Farrier and F. Goldsmith, representatives of P. B. Cow and Co., Ltd., of London, England, who recently surveyed the entire rubber situation in the United States during a 10,000 mile coast-to-coast trip. The two visitors were sent to this continent about three months ago to make a survey of materials and plant operations in connection with various rubber products in which their company is interested.

It was their personal view that natural rubber would not be obtainable from the Japanese-occupied East Indies for two or three years after the defeat of Japan. They felt sure that there would be a post-war place for synthetic rubber, particularly for the uses for which natual rubber is not as suitable. Natural rubber, however, they said, is an essential commodity and will also be in heavy demand after the war.

Mr. Goldsmith has been connected with the manufacture of barrage balloons and life saving rafts, and he said that for the last five years Britain had been making these articles out of synthetic rubber. As production had largely been switched lately to Far Eastern equipment, the resistance of synthetic rubber to heat and sun is making it very valuable, he said.

There are no plants making synthetic rubber in Britain said Mr. Farrier. The two chief products necessary for its manufacture, alcohol and grain, were more conveniently located in America, and the sites were safer from bombing. The British Government, he said, is now engaged in an extensive campaign to persuade truck drivers and essential users to recap their tires before the fabric is damaged.

Holders of the preferred shares of Goodyear Tire & Rubber Co. of Canada have been asked to tender their shares, in whole or in part, for retirement at $52.50 per share, plus 21 cents per share in lieu of accrued dividend. In a letter to the company's preferred shareholders. A. G. Partridge, president, stated it is anticipated that on June 30 next the redemption fund for the redemption of the preferred shares will exceed $250,000. Under the preferred stock provisions the company may either purchase shares in the open market between now and June 30 or redeem shares by lot after that date. Believing that there may be some shareholders who may desire to dispose of part or all of their holdings, it has been decided to give such holders an opportunity to tender stock to the company at the redemption price, Mr. Partridge said.

Manufacturers of rubber goods will find that wartime developments will provide them with an incentive to produce types of merchandise not hitherto in use, A. C. McGivern, an official of the Dominion Rubber Company Ltd., told the Westmount (Montreal) Rotary Club on March 27. The rubber industry, he said, had received more publicity during the last four years than had been achieved for it by the combined efforts of all its advertisers in the past twenty-five years.

VE-Day will mean "business as usual" at the government-owned synthetic rubber plant at Sarnia, Ontario, according to a notice which has been sent to the plant's 1,800-odd employees. The news concerning any formal declaration of cessation of hostilities in Europe will be made known to all employees immediately on receipt, but there will be no shut-down or cessation of necessary activities. "This plant must produce every possible pound of rubber," reads the notice, "and all plant and other employees are urged and are expected to stay on the job—VE-Day and every day so long as the need for rubber exists."

Some $20,000 worth of Civilian Defense Committee equipment, property of the Dominion government, which became available when CDC was disbanded recently, has been offered to the City of Montreal at cost price. It includes rubber coats, rubber boots, rubber hose and gas masks, as well as sundry other items.

The Goodyear Tire and Rubber Company of Canada, Limited, reports that profits for the first quarter are approximately the same as for the corresponding period in 1944. All plants are running at capacity, according to A.G. Partridge, president, but shortages of material, particularly carbon black, together with increased orders for war purposes, makes the extension of sales for civilian purposes less than anticipated and this condition is likely to continue for several months.

An operating profit of $1,892,176, and other income of $23,659, a total of $1,915,835, is reported by Canada Wire & Cable Company, Limited, for the year ended December 31, 1944, compared with a total of $3,304,098 for 1943.

The Goodrich tire replacement division has divided the nation into four areas, with a division manager named for each, to provide more effective sales management and control. Sales districts, however, remain unchanged except for grouping into the new divisions.

Heads R.M.A. Sundries Group

Robert J. Page

Robert J. Page, who recently joined the Rubber Manufacturers Association, has been elected chairman of the Sundries Division. Mr. Page attended the Universities of Oregon and Idaho and subsequently served for more than four years as management engineer and consultant to various manufacturers on marketing, production control, finance and corporate organization. In 1938 he joined the R.F.C. at Washington and later served as assistant to the chief of the administrative division of the Metals Reserve Co., an R.F.C. subsidiary.

Additional "E" Awards

Included among companies receiving the Army-Navy "E" award in recent weeks for production efficiency were the following:

Auburn Rubber Corp., Auburn, Ind.

General Tire & Rubber Co., Akron, Ohio.

Monroe Sander Corp., Long Island City, N. Y.

Belden Manufacturing Co., Chicago, Ill. (Two plants).

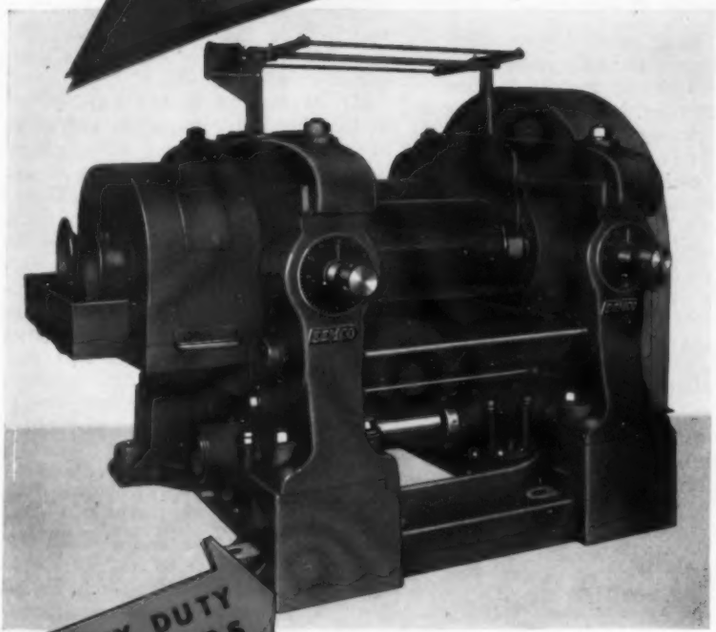
S. Buchsbaum & Co., Chicago, Ill.

A renewal star has also been awarded to the Swan Rubber Co., Bucyrus, Ohio, and a fourth star to the DeVilbiss Co., Toledo, Ohio.

The American Engineering Co., New York City, has acquired the Cochrane Corp., Philadelphia, producers of industrial and power plant equipment material, and the Faraday Electric Corp., Adrian, Mich., manufacturers of household appliances and electric signaling devices.

A multi-colored diagram of operation of the Niagara Aero Steam Condenser has been made available by the Niagara Blower Co., 6 East 45th St., New York 17, N. Y. Ask for Bulletin No. 99.

MILLS-CRACKERS REFINERS-WASHERS



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EASTERN

H. E. STONE SUPPLY CO.
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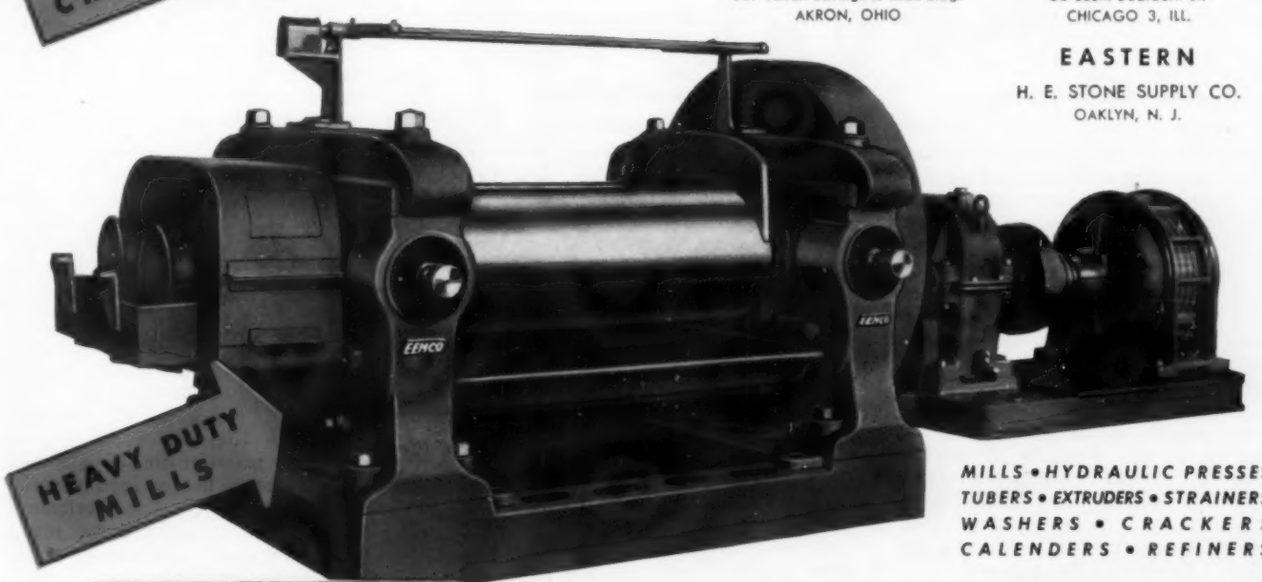

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OBITUARIES

George L. Roberts

George L. "Jack" Roberts, chief chemist of the United Carbon Co., Charleston, West Virginia, died of a heart attack suffered at the home of a friend in Yarmouth, Iowa, on April 5. Mr. Roberts, who was widely known in rubber manufacturing circles, was on his way to United Carbon's new black plant at Ryus, Kansas, for a conference. He was 46 years of age.

Although Mr. Roberts was well known as a rubber technologist he was basically a paint and lacquer chemist, joining the United Carbon Co. in that capacity in January, 1931. Prior to joining United Carbon he was engaged in research at the U. S. Bureau of Standards in Washington and also worked in several industrial laboratories. He came to the carbon concern from the Flintkote Co., where he dealt with the stabilization of emulsions and the improvement of weather-resisting properties of paint films.

Mr. Roberts was a graduate of George Washington University and following graduation he spent a year in advanced work at that institution. During the last war he served in the Marine Corps and was wounded. In the 1942-44 period he was "loaned" by United Carbon to the Rubber Reserve Co. in Washington where he performed in various capacities, including that of assistant chief of synthetic rubber production. Funeral services were held in Charleston on April 7.

Charles J. Morton

Word has been received that Capt. Charles J. Morton, formerly midwestern sales representative of the N. J. Zinc Sales Co., was killed in a plane accident in Italy on February 2.

Capt. Morton entered the service in March, 1942, and was sent overseas in February, 1943. He was member of General Clark's Fifth Army and took part in the North African campaign and in the invasions of Sicily and the Italian mainland. He had been active in the Italian theatre of operations for the past 24 months. At the time of his death he was a Battalion Supply Officer as well as a Summary Court-Martial Officer.

Starting with the N. J. Zinc Co. in 1927, Capt. Morton served for a year in the testing department at the Palmerton, Penna., plant. In 1928 he was transferred to the Chicago sales office, being assigned to the territory including Illinois, Michigan, Minnesota and Wisconsin. He lived in Chicago at 3 East Ontario St. His mother, two brothers and a sister survive.

Sponge Rubber Substitute

According to an item in a recent issue of the *Chemical Trade Journal* (of England), a new type of sponge rubber substitute has made its appearance in England. The new substitute is made of reclaimed rubber and leather charcoal, the latter being obtained from vegetable-tanned leather scrap, and is reported to be based on the discovery that leather carbon used directly as a filler in compounding rubber for sole sheeting yields a porous vulcanizate when the vulcanizate is given room to expand without any addition of inflating agent. The carbonaceous residue from the destructive distillation of leather, without further treatment beyond grinding to the requisite fineness, acts as an inflating agent, and its use is said to eliminate the special preliminary gas treatment usual in sponge rubber manufacture. It is also reported that the leather charcoal has a satisfactory filler effect. Since the friable carbon does not act as a reinforcing agent, even when finely ground, large amounts can be incorporated in the mix without unduly stiffening the sponge vulcanizate.

New Vanderbilt Reports

Several new laboratory reports have been made available in recent weeks by the R. T. Vanderbilt Co., 230 Park Ave., New York 17, N. Y. These booklets, the contents of which are indicated by their titles, include: GR-S Compounds for Wire and Cable (Booklet No. 5C); GR-S Compounds of Graduated Hardness (Booklet No. 7); Rio Resin in GR-S for Sunlight Resistance (Booklet No. 9); Miscellaneous Items—Vulcanizing Thick GR-S Articles, Soft GR-S Stocks, etc. (Booklet No. 11). As usual, copies of these booklets may be secured by reputable concerns without cost on application to the company.

Adoption of an employees' retirement plan designed to provide retirement pensions at age 65 to supplement the benefits provided by the Social Security Law has been announced by the Witco Chemical Co. All employees of the company and its subsidiary, the Pioneer Asphalt Co., participate in the plan after they have completed five continuous years of service, the entire cost being absorbed by the company.

TECHNICAL PAPERS FEATURE CHICAGO GROUP'S MEETING

Two technical papers, one on "Polyester-Type Resins in the Rubber Industry," by Frederick J. Myers, of the Resinous Products & Chemical Co., Philadelphia, and the other on "The Manufacture of Molds for Rubber and Plastics," by S. O. Black and I. W. Robinson, of the Dryden Rubber Co., Chicago, which was delivered by Mr. Black, featured the meeting of the Chicago Rubber Group which was held on March 23 in the Morrison Hotel, Chicago. Approximately 300 members and guests were in attendance.

Mr. Myers presented a brief picture of the chemical constitution and utility of polyester-type resins as a general class and the linear type resins in particular. The use of Paraplex G-25 as a plasticizer for polyvinyl chloride and Buna N synthetic rubbers was also discussed. In discussing some of the elastomeric linear polyesters, including Paraplex X-100, a peroxide-curing elastomer, and Paraplex S-200, a sulfur-curing elastomer, Mr. Myers said that such "rubbers" are generally characterized by high resilience, good low temperature flexibility without extractable plasticizers, and oil resistance approaching that of the Buna N type rubbers. The speaker also outlined a postulated mechanism for peroxide curing.

In discussing molds and dies for rubber and plastics, Mr. Black, the second speaker, pointed out some of the danger points to be watched in the manufacture of such molds. He traced some of the intricate steps in mold manufacture, and briefly discussed some of the preferred materials to be used.

During the course of the meeting, Dr. H. A. Winkelmann, of the Dryden Rubber Co., chairman of the Reclaim Scrap Contest Committee, reported that several entries for this contest had already been received.

Kemprene Products Company, Philadelphia, has developed and introduced a substitute for rubber cement, known as Kemprene, that is said to have the properties of rubber cement, yet contains no critical material.

Vaughn-G. E. Witt Co. and the Rucker Equipment Co., both of Oakland, Calif., have merged to form the Rucker-Vaughn Co. The new company will continue the manufacture of standard pressure valves, oil burners, and a special line of compressed air line lubricators. It will also act as sales agent for a representative group of compressed air and production tools.

A gas mask for dogs, which affords protection against chlorine, phosgene, and other choking gases, has been adopted by the Chemical Warfare Service for use by war dogs. The mask will fit 97 percent of all war dogs.

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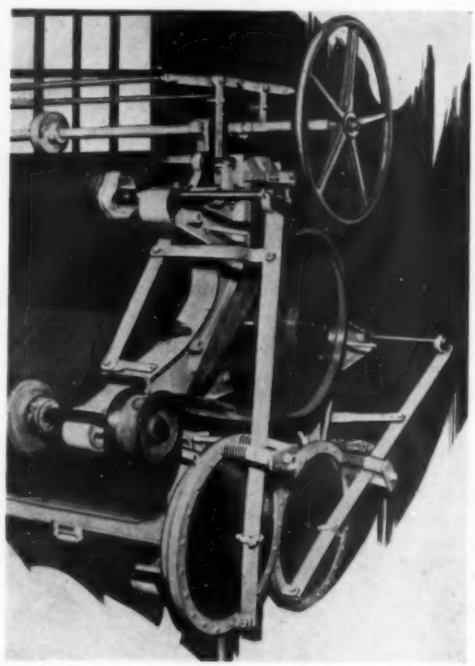
BLACK ROCK MANUFACTURING CO. Bridgeport, Conn.

NEW EQUIPMENT

Stanford Web Guide

Perfected about two years ago by the Stanford Engineering Co., Salem, Ill., and since installed in many factories, the Stanford Web Guide, illustrated herewith, is an extremely simple device, pneumatically operated, and directly actuated by a circular vacuum chamber. The sensitive diaphragm both controls and



powers the guiding operation. According to the manufacturers, this guide keeps the trim or weave of a roll well under one-half inch.

The accompanying illustration shows two Stanford Web Guides installed on a doubler, the vacuum chambers and the arms which keep the rolls in alignment being clearly indicated. The manufacturers state that if a guide is used upon the inspection or make-up machine, thus providing a guided roll before going to the doubler, both rolls may be guided through the doubler with a single guide, with both selvages held within 1/16ths of an inch, plus or minus.

On combining and backing machines, the guide will put the selvages squarely together, eliminating any person now trying to pull such selvages together, and produce a combined fabric upon which users can lay their patterns to the very edge, instead of an inch or so inside the selvage. On cutting, spreading or doubling machines, it will guide the fabric right up to the wings of the spreading knife, thus eliminating the fouling of rollers with compound, stops to clean the rollers, and the cost of solvents required to wash them. On re-wind, make-up or slitting machines, the guide will keep the weave within 1/16ths of an inch, plus or minus. The Stanford Web Guide handles materials such as cellophane, waxed paper or other webs with a true-cut edge and produces rolls with ends as true as though cut by a knife.

Improved Taber Abraser

An improved Taber abraser, designed and manufactured by the Taber Instrument Corp., North Tonawanda, N. Y., is now available in a complete testing set, as illustrated herewith. The testing set includes an abraser, with all accessories, together with a speci-

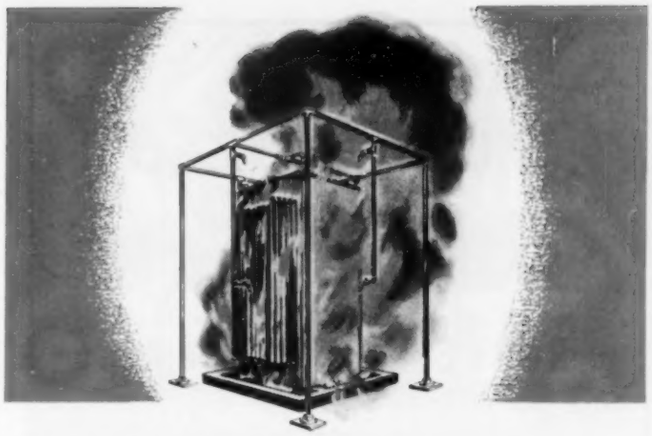
men table for running tests under wet or moist conditions. An illuminated magnifier for the inspection and examination of specimens is part of the set.

The wearing action of the abraser is performed by dual Calibrase wheels bearing against the specimen under constant pressure, revolving in opposite directions, one sliding radially toward the outside and the other sliding toward the inside of the wear path. Each wheel revolving at a steady constant speed through contact with the specimen exerts a combined abrasive, compressive and twisting action twice in each revolution of the specimen holder. Because the specimen holder travels a complete circle, the wear due to differences of grain or weave is fully revealed. A standardized load adjustment is provided for varying the pressure of the Calibrase wheels against the specimen so the abraser will test both delicate and tough materials with equal precision.

The Taber abraser is self-contained and ready to operate by simply plugging into an electric line. The results of tests are reported either as the number of "Wear Cycles" or as "Loss in Weight" when weighed on a precision laboratory balance.

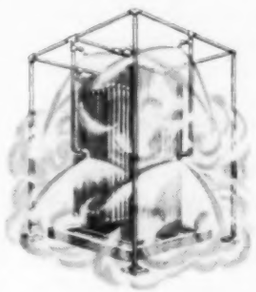
FOR LOW HEAT BUILD-UP, USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 4)



SUPPOSE YOU HAD *only 11 seconds*

to extinguish a roaring transformer fire!



Impossible? Not for "Automatic" FIRE-FOG. In a recent fire test that's just what happened.

Using a standard transformer with FIRE-FOG protection, we ignited transformer oil in and around it and *permitted* the resulting fire to burn several minutes. Then it was up to FIRE-FOG to demonstrate its ability. And it did!

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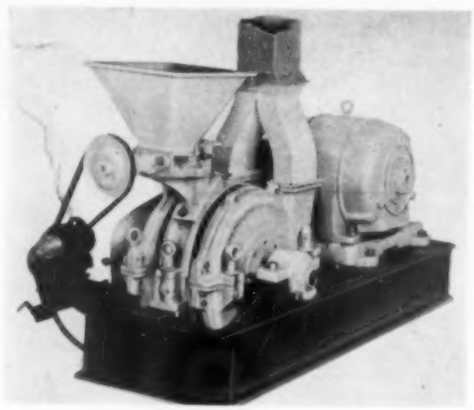
SPRINGFIELD, NEW JERSEY

Mechanical Screenless Pulverizer

The Mikro-Atomizer, a new mechanical, screenless pulverizer for the efficient production of ultra fine powders from 1 to 25 microns, has been announced by the Pulverizing Machinery Co., Summit, N. J. Made by the makers of the well-known Mikro-Pulverizer, this new compact and highly efficient mill has been



developed to produce powders of a fineness far beyond the ability of the former equipment. The new Mikro-Atomizer permits guaranteed performance to particle sizes as low as 1 to 2 microns on certain materials. In addition it provides a much cooler operation.

The principle of operation in the new Mikro-Atomizer is a most simple one. The raw material is fed into the mill from the customary hopper. After its initial breaking down by the rotating hammers, it is atomized by an air stream which carries the dispersed particles into a separator wheel, where they are whirled about at the rapid rate of from 4000 to 7000 rpm.

A fan adjacent to the separator wheel exerts just enough suction to draw out the finest particles and discharge them. But, the centrifugal force imparted by the separator wheel so increases the gravitational weight of the coarser particles that they resist the pull of the fan, and drop back into the path of the hammers where they are beaten and rebeaten until they are fine enough to completely yield to the pull of the fan.

This pull, or aerodynamic drag, in opposition to centrifugal force, is the underlying principle in the design of the Mikro-Atomizer. The relationship between the radius and width of the separator wheels (centrifugal force) and the radius and width of the fan blades (aerodynamic drag) determines the fineness and capacity of the pulverizing machine on any given material.

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Precision Scientific Polarizer

A new Polarizer, which is used to determine the amount of strain produced by fabrication or mechanical manipulation of transparent, rigid and non-rigid plastic materials, and which can also be used to iden-

tify transparent plastics, has been developed by the Precision Scientific Co., 1750 No. Springfield Ave., Chicago 47, Ill. The device consists of a source of illumination diffused through opal glass for uniformity. Above the light source are placed two polaroid sheets, sandwiched between clear glass, the upper glass section being adjustable through a distance of approximately 8 inches. The lights are enclosed in a sheet metal base. The Polarizer is 15 inches square and 16 inches high. Polaroids and glass plate are rubber cushioned. The maximum sample size for observation is 11 by 11 inches.

Ransome Machinery Co., Dunellen, N. J., has added the Model 1H **hand-operated positioner** to its line of welding and work positioners. It is said to provide a handy tool to facilitate production and repair welding, assembly, overhauling, drilling, hard-surfacing, and similar operations on all small work. It has a tilting range of 150 degrees, revolves 360 degrees, and can be locked in position.

A new line of industrial **cold cathode fluorescent fixtures** employing the 93-inch low voltage Colovolt Lamps has been made available by the General Luminescent Corp., 638 So. Federal St., Chicago 5, Ill. These fixtures may be secured in 2-lamp and 4-lamp models for mounting singly or in continuous lines.

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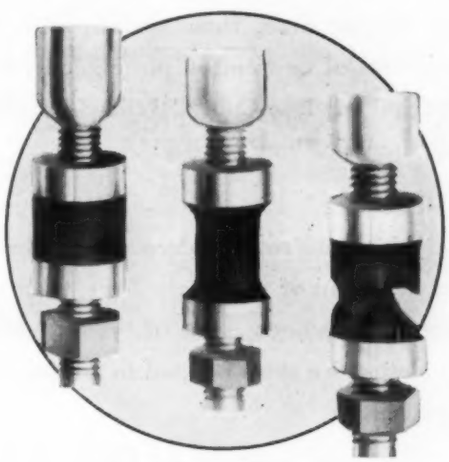
With Reanite you can forget slow, costly brass plating in rubber-to-metal adhesion. Merely substitute two quick-drying coats of Reanite cement for the brass plating operation and proceed as usual. Follow your standard practice for curing time, pressure and temperature. *Reanite bonds will prove stronger than the rubber itself!*

Reanite will bond natural rubber or Buna S with practically integral adhesion to steel, aluminum, magnesium, copper, in fact almost any metal.



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If your concern is using untreated liners because you believe that processing would make them too expensive, we emphasize that Capitol Process Liner Treatment is reasonable in cost.

Further, our treatment will make it possible to use your liners for a considerably longer time, thus actually reducing purchases of new cotton piece goods. Over a period of time Capitol Liner Treatment will, literally, "pay for itself."

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REVIEWS

BOOKS

Colloid Chemistry. Vol. V. Edited by Jerome Alexander. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y. 6 x 9 in. 1256 pp. $20.00.

Based on the wide circulation and usefulness of the first four volumes of this series, the author was requested to prepare two new volumes to cover more recently developed theories, methods and procedures concerned with colloid chemistry. The current volume (Vol. V) contains papers dealing with theory and methods, and biology and medicine, while the forthcoming volume (Vol. VI) will contain those dealing with technological applications.

Like the previous editions, the wide variety of topics considered in this series, each prepared by internationally-known contributors, and the different modes of approach to the same or interrelated subjects, furnish a broader and more integrated view of natural phenomena than is obtainable from treatises of more limited scope. Although war conditions have prevented the editor from securing, as before, a world-wide representation of nations and nationalities, the enormous development of American science and technology has enabled him to secure a rather complete group of contributors, who represent a variety of national origins. The subject of polymerization is handled by Mark and that of the elasticity of rubber by Guth.

As mentioned above, the book is divided into two sections, the first treating with theory and methods and the second with biology and medicine. Among theories and methods discussed are those pertaining to material structure, surfaces, the electron microscope, microradiography, rheological properties, high-vacuum distillation, the cyclotron, the betatron, high-speed centrifugation, Liesegang rings, and sonic and ultrasonic waves in colloid chemistry. There are, of course, excellent author and subject indexes, in addition to which fairly complete bibliographies appear at the end of each chapter.

●

National Fire Codes for Flammable Liquids, Gases, Chemicals and Explosives. (1945 Edition). Compiled by Robert S. Moulton. Published by the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. 6 x 9 in. 592 pp. $3.00.

Superseding similar codes for 1943, this new volume, which assembles for the convenience of the reader the many standards dealing with explosive hazards, contains up-to-date information on new chemicals and solvents used in war industries, including information on their fire hazard properties and the best method of fire extinguishment. In addition, there are six new or revised codes. The volume is divided into nine parts, as follows: Flammable Liquid Storage and Handling; Oil and Gasoline Burning Equipment; Liquefied Petroleum Gases; Utilization of Flammable Liquids; Gases; Refrigeration and Fumigation; Explosive and Nitrocellulose Materials; Tables of Properties—Hazardous Chemicals, Flammable Liquids; Flash Point Tests. Numerous tables and drawings are included.

●

1945 Plastics Catalog. Published by Plastics Catalogue Corp., 122 East 42nd St., New York 17, N. Y. 8½ x 11½ in. 1200 pp. $6.00.

This ninth revised and expanded "encyclopedia of plastics" continues the chronicle of wartime advances achieved by the over-all plastics industry, but an innovation is made in the introductory section by the inclusion of a full-color review of the civilian plastics of the past together with their counterparts of the future as rendered by a group of well-known industrial designers. Another innovation in the latest edition is the inclusion of industry statistical information, covering molding powder production, compression presses, injection machines,

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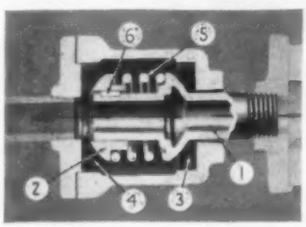

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It is being used on Paper Making and Textile machinery, in cold strip steel mills, on machine tools, and for an increasingly wide range of other applications. So completely does it outmode the old style stuffing box that industry has already adopted over 50,000 Johnson Joints in the few years since their development.

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THESE RESINS HAVE EXCEPTIONALLY GOOD ELECTRICAL AND LOW WATER-ABSORPTION PROPERTIES

For Details and Samples Write

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Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
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Weathering qualities of
RUBBER PRODUCTS
determined with reliable
accuracy in the

ATLAS *twin arc*
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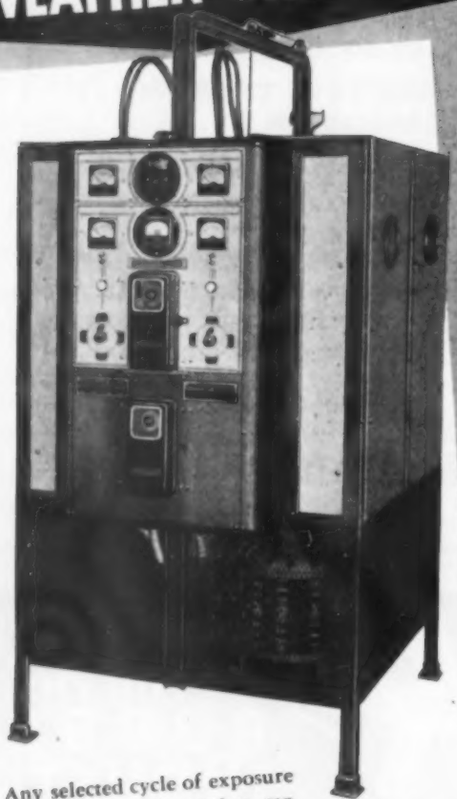

Any selected cycle of exposure to sunlight and wetting can be set for automatic continuous testing in the Weather-Ometer. Exact tests can be duplicated at any time by settings on the control panel which contains temperature regulator—time meter—light and water cycle switch — automatic cut-off switch — voltage adjusting switch — direct reading thermal regulator — reactance coil (for economical current consumption). The Weather-Ometer is fully automatic in operation; can be left unattended over night; only necessary to renew carbons once in 24 hours. Years of exposure to any conditions of weathering reduced to a few days testing in the laboratory with the Weather-Ometer.

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extrusion machines, etc. The first over-all price list of plastics is also included as is a section detailing A.S.T.M. standards. All of the technical material has been completely revised and brought up-to-date, including the section devoted to Synthetic Rubbers and Rubber-Like Plastics. Tabular information, in chart form, is furnished on plastics properties, plastics identification, chemical formulae, plastics materials manufacture, solvents, plasticizers, plastics used in liquid coatings, and synthetic rubbers. The Directory Section of the volume contains 10 complete directories to all branches of the plastics industry, including educational institutions, molders, material manufacturers, and trade names.

BOOKLETS, CATALOGS, Etc.

100 Years of Air Control. Issued by A. Schrader's Son Division of Scovill Manufacturing Co., Inc., 470 Vanderbilt Ave., Brooklyn 17, N. Y. 7 x 10 in. 48 pp.

Compiled and issued in commemoration of the 100th Anniversary of A. Schrader's Son, this attractively printed booklet briefly traces the history of the Schrader organization during a century which may well be considered the most significant in all history. For a hundred years Schrader has specialized in the design and manufacture of fittings for rubber goods, and since the introduction of pneumatic tires over fifty years ago has been one of the leaders in the development of pneumatic valves for the automotive and tire industries. The company has also contributed to the development of safe and efficient diving equipment, and has been identified with undersea salvage and exploration since 1849. Some of the company's early work and development along these lines is outlined in the booklet.

•

Survey of Employment and Reconversion. National Association of Manufacturers, 14 W. 49th St., New York 20, N. Y. 8½ x 11 in. 20 pp.

Privately-owned American manufacturing industry will provide from 3,400,000 to 4,400,000 more jobs after reconversion from war to peace than it did in 1939, according to the results of this survey of the plans of individual manufacturers. Seventy-nine percent of manufacturing concerns, it is calculated, will employ more persons than they did before the war, 16% will employ the same number, and 5% will be down from the pre-war level. The survey was based upon 1,756 replies to a questionnaire sent to N.A.M. members and manufacturing associates located in 43 different states.

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(FOR FURTHER DETAILS, SEE AD ON PAGE 4)

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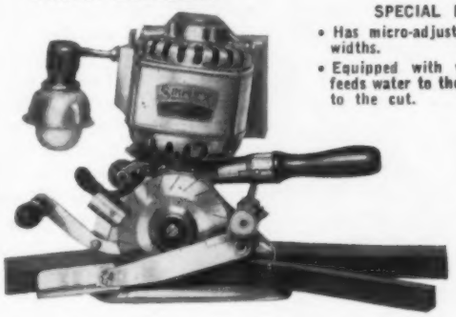
RUBBER STRIP CUTTER

PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.



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- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
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Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

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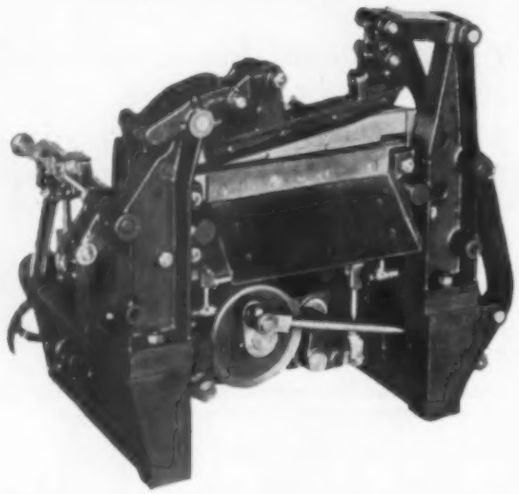
Automatic Feeding and Cutting Machine Type "HP"



Will handle light gauge materials rigid enough to permit a push feed. Feed adjustable from 1/8″ to 14″. Sheets or strips can be cut at a rate of 30 to 80 cuts per minute. Machines from 9″ to 100″ in width.

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A NEW PALM FATTY ACID OF MEDIUM TITRE, SYNTHETICALLY MADE

Excellent as a replacement for Stearic Acid in rubber compounding.

PALMALENE SPECIFICATIONS

Saponification Number	180-185
Iodine Value	55-60
Titre	35

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REVIEWS (CONT'D)

The Future of Industrial Research. Published by the Standard Oil Development Co., 30 Rockefeller Plaza, New York 20, N. Y. 6 x 9 in. 174 pp.

Recognizing that adequate plans must be made for the post-war research which must lead industry towards new goals, the Standard Oil Development Co., the central research organization of Standard Oil Co. (New Jersey), made its Silver Anniversary in October, 1944, the occasion for a Forum on the Future of Industrial Research. The Forum consisted of papers and discussions, all of which are reproduced in this book. Among those contributing papers were Frank B. Jewett, Thomas Midgley, Jr., Harry L. Derby, Bradley Dewey, Edwin H. Land, Westbrook Steele, Earl P. Stevenson, Clyde E. Williams, A. C. Fieldner, and Robert P. Patterson. Participating in the discussion were such outstanding technologists as C. F. Kettering, Lyman J. Briggs, Morehead Patterson, Lammot du Pont, R. W. Gallagher and Frank A. Howard. The latter also contributes an introduction and summary to the book.

•

Flexible Shaft Handbook. (2nd Edition). Published by Industrial Division, S.S. White Dental Mfg. Co., 10 East 40th St., New York 16, N. Y. 5½ x 8½ in. 256 pp.

This revised edition brings information and engineering data about flexible shafts up to date, covering the progress and the many developments that have been made since the first edition was issued in 1929. The book is divided into three major sections: (1) Flexible Shafts for Power Drives; (2) Flexible Shafts for Remote Control; (3) Connecting Flexible Shafts. Installation photographs are liberally used and diagrammatic sketches appear throughout the volume. Specifications are furnished in practically all instances. Copies of this handbook are furnished without cost to industrial engineers, but requests must be made on business letterheads and must indicate the writer's title or position.

•

Optonic Color System. Arco Co., 7401 Bessemer Ave., Cleveland 4, Ohio. 8 x 10½ in. 12 pp.

This booklet is a color-selection guide designed to permit persons without detailed technical understanding of color science to specify color shades that minimize fatigue and promote safety for industrial, commercial and institutional interiors. The answers to the usual color-selection problems have been reduced to 18 short and simple rules which relate to the colors in the company's "optonic" system. A folder containing color samples is included for convenience. Another Arco booklet, "Color Power for Industry," consists of a series of pictorial illustrations of the company's "eye-ease colors" for use in industrial interiors.

•

Superior Industrial Marking. Superior Type Co., 1800 Larchmont Ave., Chicago, Ill. 8½ x 11 in. 48 pp.

Some of the principles of design embodied in the machines and equipment developed by this company in the field of industrial marking are shown and described in this catalog. The catalog is divided into five sections covering, respectively, the marking of cylindrical, hexagonal and conical products; the marking of boxes, crates and other flat surfaces; miscellaneous products and their marking devices; marking inks and their accessories; and rubber dies, type and logotypes. An index is supplied for the user's convenience.

•

Maintenance Information for the Delivery Truck Operator. (1945 Edition). Studebaker Corp., South Bend 27, Ind. 6 x 9 in. 48 pp.

This booklet is designed to help operators of trucks of all makes extend the life of their trucks and tires and to handle their own minor repairs. There is a lengthy section devoted to diagnosing truck troubles, which is conveniently divided into sub-sections treating the subject from various angles.

Utility Crimper Type Flipper
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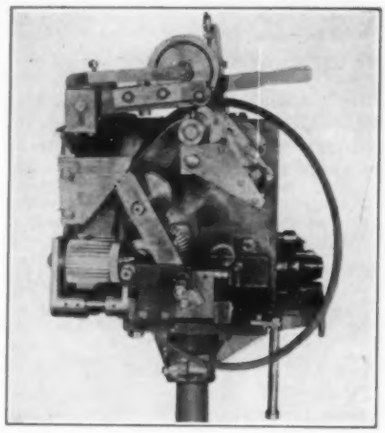

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SOLE COMPOUNDS

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Request samples and prices

RAYON PROCESSING CO. of R.I. INC.
100 TREMONT ST., CENTRAL FALLS, RHODE ISLAND
Developers and Producers of Cotton Fillers for Plastics

1945 Classified Directory of the Association of Consulting Chemists and Chemical Engineers, Inc. Published by the Association, 50 East 41st St., New York 17, N. Y. 7¾ x 10¾ in. 108 pp.

The latest edition of this directory, the ninth to be published, has been completely revised and brought up-to-date. It comprises three sections, the first listing about one hundred fields of chemistry and engineering, the second describing the qualifications of member consultants and their particular scope of activities, and the third devoted to indexes, including a complete membership list and geographical locations of members. A guide for using the directory most efficiently is also included.

•

Production Management. Albert Ramond and Associates, Inc., Chrysler Bldg., New York 17, N. Y. 8¼ x 11 in. 40 pp.

How production management affects productivity, costs, and employment is the subject of this booklet, which outlines procedures and policies helpful in attaining effective use of all industrial resources. Sections are devoted to work measurement, method improvement, labor cost and expense control, production control, job evaluation, and incentive wage plans for production workers. Labor's attitude toward increased productive efficiency is also discussed. There are 12 pages of supplementary pictorial diagrams and charts.

•

Continex SRF in Oil-Resistant and Butyl Synthetic Rubbers. Witco Chemical Co., 435 No. Michigan Ave., Chicago 11, Ill. 8½ x 11 in. 24 pp.

This latest technical report is a continuation of the work on Continex SRF begun in a previous report (No. 44-3). The new results cover physical properties of GR-M, GR-I, Hycar OR-15, reclaim and GR-S-reclaim blends when loaded with Continex SRF in progressively increasing amounts. Data on tensile, elongation, tear resistance and hardness is given in practically all cases. Comparison of various blacks for eacn compound is also made.

•

Review of Dan River Research and Patent Digest. Riverside & Dan River Cotton Mills, Inc., Danville, Virginia. 6 x 9 in. 30 pp.

This is a brief description of developments in textile manufacturing which are direct results of a long-range research program carried out by the company. Various patents and applied-for patents are also described, along with references to some of their commercial uses.

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(FOR FURTHER DETAILS, SEE AD ON PAGE 4)

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Sifters, Crushers, Cutters, Dry and Liquid Mixers, Mills, Grinders, Pulverizers, Conveyor Systems, Complete Installations.

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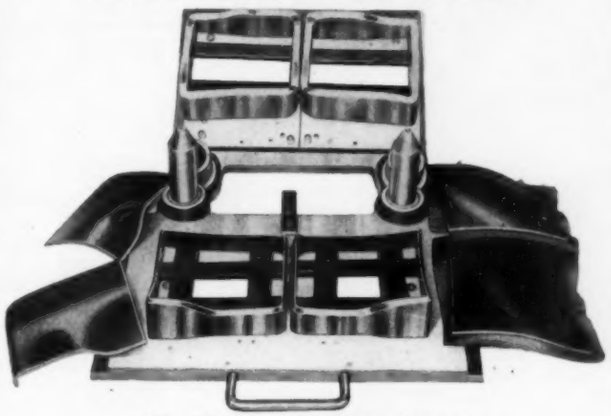

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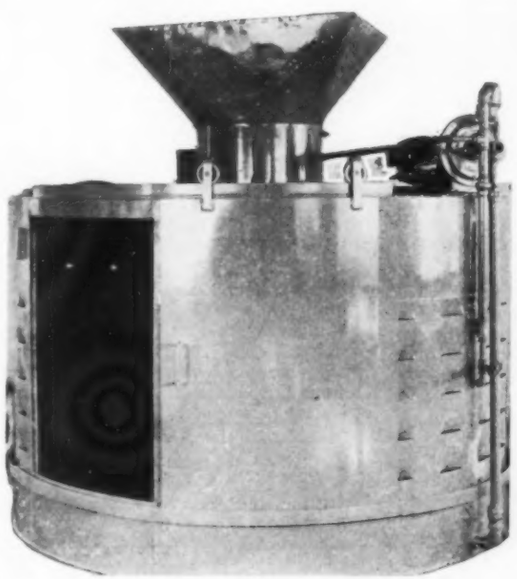

RUBBER SLAB COOLER

The mill room equipment at the left is used to lubricate cool and dry rubber slabs having been hand cut from a rubber mixing mill.

Do that job for less money, in less floor space with cleanliness around your mills.

Simple to operate, practically no maintenance or care required.

Set in required location. No anchor bolts necessary. Connect electrical line, water and drain. It is then ready for operation.

FURTHER DETAILS UPON REQUEST.

The Akron Standard Mold Co.

Akron — "The Established Measure of Value" — Ohio

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, APRIL 11, 1945

Crude Rubber

GUAYULE held the spotlight in the crude rubber situation in the past month. On March 29 the House Agricultural Committee, after an extensive investigation, recommended government sponsorship of a ten-year program for domestic rubber production, including increased planting of guayule and additional experimentation with all domestic rubber-bearing shrubs, including the imported kok-saghyz. The recommendations were contained in a report approving legislation to authorize experimental work and to guarantee guayule producers a minimum price of 28 cents a pound until 1956.

According to the report, the government should underwrite the domestic rubber growing program in order to insure an adequate supply of rubber, which was termed one of the most critical items in our entire economy, and to help provide a new cash crop for the nation's farmers. The latter point was especially emphasized, because "without some new cash crop the farmers must in the near future turn to the production of the very crops already produced in abundance in many other sections and this can only result in loss to all concerned."

The recent legislation introduced by Representative Poage (Texas), as reported in our last issue, would limit the minimum, guaranteed price payments to production from 400,000 acres nationally, and the guarantee would apply only to plots of forty acres or less. The proposed bill will come up for discussion in the House in the near future.

Prices shown below are ceilings set by the Rubber Reserve Company:

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X	22½	40
Thick Pale Latex Crepe, 1X	22½	40
Thin Pale Latex Crepe, 1X	22½	40
Thick Brown Crepe, 1X	21⅜	38⅞
Thin Brown Crepe, 1X	21⅜	38⅞
Thick Remilled Blankets, #1	21⅜	38⅞
Rolled Brown or Flat Bark	18	35½
Smoked Blankets, #1	21⅛	38⅝
Claro Brand 1XRSS	22½	40
Sole Crepe Trimmings	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Crude	15	29
Cut Fines, Crude	15½	29¾
Cut Fines, Washed & Dried	22½	40
Upriver Coarse, Crude	12⅝	26⅛
Upriver Coarse, Washed & Dried	20¼	37¾
Caucho Ball, Crude	11⅝	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17½	31
Less than Carload Lots	18	31½
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¼	23¼
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¾	44¼
Centrifuged, Tank Car Lots	27¾	45¼
Heat-Concentrated, Carload Drums	29½	47

C for Civilian Use; N-C for Non-Civilian Use.

Scrap Rubber

As anticipated, the increasing production of reclaim, needed to take up some of the slack caused by the carbon black shortage, has resulted in greater demand for scrap rubber. Reclaimers are slowly stepping up over-all production from the 18,000 ton-a-month to the requested 25,000-ton-a-month rate. Demand is still largely for tire and tube scrap, although some call for miscellaneous mechanicals has been noted in some quarters. Some uncertainty exists with regard to current government agency sales of tires due to the revised scrap rubber schedule (R.P.S. 87). Trade circles point out that some confusion has arisen on such bids because government sales are on a shipping point basis and delivery costs must be computed by Army, Navy or other officials to see that the maxima are not being violated. Prices shown below are ceilings on typical grades of scrap:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$20.00
Beadless truck tires	ton	26.00
Mixed truck tires	ton	20.00
Beadless passenger tires	ton	26.00
No. 1 passenger peelings	ton	52.25
No. 1 truck peelings	ton	52.25
No. 2 passenger tubes	lb.	.07¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06½
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.06½
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41
CHAFERS			
Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36	in.	5.50	lb.	—	@ 8.272
40x40	36	in.	6.15	lb.	—	@ 7.398
40x36	36	in.	6.50	lb.	—	@ 7.000
48x48	40	in.	2.50	lb.	—	@17.200
48x48	40	in.	2.85	lb.	—	@15.087
56x60	40	in.	3.60	lb.	—	@12.638
48x44	40	in.	3.75	lb.	—	@11.733

Note: Prices shown above are ceiling prices set by order of the O.P.A.

Cotton

The price of middling uplands on the Cotton Exchange has swung in a 44 point orbit since our last report, high for the period being 22.73 on April 10 and low 22.29 on March 27. The average price of middling uplands on the Exchange for the month of March was 22.43, based on 25 trading days. Prices were irregular in mid-March, although tending upward, as traders studied pending Federal legislation, although passage of legislation extending the life and borrowing power of the Commodity Credit Corporation and the vote of the Senate Banking Committee to reduce gold reserve requirements had little influence on the market. Prices began to move up steadily in early April, based largely on aggressive trade and Wall Street buying. The growing belief that the CCC might call all 1943 and 1944 cotton loans was also a strong influence. The upward trend has continued in the past few days, despite the Allied advance through Germany and the denunciation by Russia of its pact with Japan, forerunner of Russia's entrance into the global war. The International Cotton Advisory Committee formally announced its decision to seek a solution of the problem of world cotton stocks and surplus production by "international collaboration" today (April 11). Quotations for middling uplands on the Exchange follow:

	Mar. 14	April 11		
	Close	High	Low	Close
July	21.88	22.25	22.16	22.21
October	21.87	21.89	21.78	21.79
December	21.18	21.80	21.70	21.73

Reclaimed Rubber

As additional orders restricting the use of crude rubber and carbon black in permissible products are issued, several such orders having been issued in the past four weeks, the demand for reclaim rises. Demand is now at an all-time peak and is expected to continue at this high level for months to come. As pointed out recently by WPB, tire and tube production accounts for 50% of all reclaim, camelback for 8%, and heels and soles for 17%, the remainder being scattered among a number of smaller branches of the industry. Reclaimers are doing everything possible to step up production to the requested 25,000-tons-a-month, but manpower continues to be the primary stumbling block. However, some progress is being recorded. Prices shown below are ceilings on typical grades of reclaim:

Shoe			
Unwashed	lb.	.07½ @	.07¾
Tube			
Black Tube	lb.	.11¾ @	.12
Red Tube	lb.	.12½ @	.12¾
Tires			
Black (acid process)	lb.	.08 @	.08¼
Black, selected tires	lb.	.07 @	.07¼
Truck, Heavy Gravity	lb.	.09 @	.09¼
Miscellaneous			
Mechanical blends	lb.	.05 @	.06
White	lb.	.13½ @	.13¾

Ducks

Enameling (single filling)	lb.	— @	.44¼
Belting and Hose	lb.	— @	.39
Single filling, A grade	lb.	— @	.19¾
Double filling, A grade	lb.	— @	.20¾

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RUBBER DENUDING
WITHOUT AFFECTING THE PHYSICAL PROPERTIES OF METAL INSERTS
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OXIDES AND CARBONATES LIGHT AND HEAVY • FOR TECHNICAL & DRUG USES
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No need for guesswork in the testing of your own or competitor's products for wearability or resistance to surface abrasion. The Taber Abraser gives you the facts with scientific precision—yet the procedure is as practical as it is accurate. Eliminates time-consuming, expensive performance tests. Used by hundreds of manufacturers and research laboratories for testing surface wearing qualities of paints, lacquer, plastics, leather, rubber, paper, electrotypes, etc.

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• Years of experience making dies of all kinds for rubber manufacturers enable us to offer you correctly designed dies of tempered steel which retain their cutting edges....*Send blue print for quotation.*
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Stearns Improved Air Cooled Magnetic Pulley
CLUTCHES-BRAKES
PULLEYS
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Stearns magnetic clutches and brakes offer smooth, efficient operation with near or remote control. Bulletin 225.
Processing scrap rubber requires Stearns Magnetic pulleys or other types of magnetic separators. For economical, automatic, efficient protection against costly shutdowns due to tramp iron damage, Stearns Magnetic equipment will pay for itself many times over—a definitely profitable investment.
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STEARNS MAGNETIC MFG. CO.
640 S. 28th St. Milwaukee 4, Wis.

CHEMICAL MARKETS

New York, Apr. 11, 1945
All Prices F.O.B. Works

ACCELERATORS

Organic

A-1 (Thiocarbanilid)	lb.	.28	.33
A-10	lb.	.36	.42
A-19	lb.	.52	.58
A-32	lb.	.60	.70
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Aldehyde ammonia, crystals	lb.	.65	.70
Altax	lb.	.39	.41
Beutene	lb.	.59	.64
B-J-F	lb.	.34	.39
Butasan	lb.	—	1.10
Butyl Zimate	lb.	—	1.10
Captax	lb.	.34	.36
Crylene	lb.	.40	.47
Di-Ortho-Tolyguanidine	lb.	.44	.46
Diphenylguanidine	lb.	.35	.41
El-Sixty	lb.	.36	.43
Ethasan	lb.	—	1.10
Ethyl Tuads	lb.	—	1.25
Ethyl Zimate	lb.	—	1.10
Ethylidine aniline	lb.	.42	.43
Formaldehyde aniline	lb.	.31	—
Guantal	lb.	.39	.48
Hepteen	lb.	.34	.39
Hexamethylenetetramine	lb.	.33	—
Lead Oleate, No. 999	lb.	.13	—
Witco	lb.	.15	—
Ledate	lb.	—	1.20
Methasan	lb.	—	1.20
Methyl Tuads	lb.	—	1.25
Methyl Zimate	lb.	—	1.20
Monex	lb.	—	1.25
Pentex	lb.	.74	.84
Phenex	lb.	.49	.54
Pip-Pip	lb.	—	1.63
R & H 50-D	lb.	.42	.43
R-2 Crystals	lb.	—	1.55
Rotax	lb.	.44	.46
Safex	lb.	1.15	1.25
Santocure	lb.	.60	.67
Selenac	lb.	—	1.60
SPDX-G	lb.	.53	.58
Super-Sulfur No. 3	lb.	.13	.15
Thiocarbanilid, drums	lb.	.28	.33
Thiofide	lb.	.39	.46
Thiotax	lb.	.34	.41
Thiurad	lb.	—	1.25
Trimene	lb.	.54	.64
base	lb.	1.03	1.18
Triphenylguanidine	lb.	.45	—
Ulto	lb.	.99	1.04
Ureka	lb.	.50	.57
Blend B	lb.	.50	.57
Blend C	lb.	.48	.55
Vulcanex	lb.	.42	.43
Vulcanol	lb.	.85	—

Inorganic

Litharge, domestic	lb.	.07	.07½
Magnesia, calcined, heavy	lb.	.04	—

COLORS

Blues [b]			
Prussian	lb.	.36	—
Ultramarine	lb.	.17	.27
Browns [b]			
Mapico	lb.	.1135	—
Umber, Turkey	lb.	.04¼	—
Greens [b]			
Chrome	lb.	—	.25
Guignet's Green	lb.	.70	—
Reds			
Antimony crimson, 15/17	lb.	—	—
Indian	lb.	.08¾	—
Domestic (Maroon)	lb.	.11	—
Mapico	lb.	.096	—
Red oxide, pure	lb.	.10	.12
Rub-Er-Red	lb.	.09¾	—
Whites [b]			
Cryptone No. 19	lb.	.0560	.0585
Cryptone CB No. 21	lb.	.0560	.0585
Cryptone ZS-800	lb.	.0825	.0850
Lithopone:			
Albalith	lb.	.04¼	.04½
Astrolith	lb.	.04¼	.04½
Azolith	lb.	.04¼	.04½
Ray-cal	lb.	.05½	.05¾
Rayox	lb.	.14½	.15¼
Titanox A	lb.	.14½	.14¾
Titanox B	lb.	.05¾	.06
Titanox C	lb.	.05½	.05¾
Zinc Oxide—American Process [b]			
American Azo:			
ZZZ (lead free)	lb.	.07¼	.07½
Anaconda, lead free	lb.	.07¼	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼	.07½
XX Red—4	lb.	.07¼	.07½
XX Red—72	lb.	.07¼	.07½
XX Red—103	lb.	.07¼	.07½
Kadox, black label—15	lb.	.07¼	.07½
Red label—17	lb.	.07¼	.07½
St. Joe, black label	lb.	.07¼	.07½
green label	lb.	.07¼	.07½
red label	lb.	.07¼	.07½
U. S. P.—7, bbls.	lb.	.10½	10¾
Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½	.09¾
Green seal—8	lb.	.09	.09¾
Red seal—9	lb.	.08½	.08¾
Yellows [b]			
Cadmolith	lb.	.55	.60
Chrome	lb.	—	.50
Mapico	lb.	.071	—

BLACKS

(In bags, carload lots)

Arrow Compact	.0355	—
Atlantic	.0355	—
Certified	.0355	—
Certified Spheron	.0355	—
Continental	.0355	—
Disperso	.0355	—
Dixiedensed	.0355	—
Dixiedensed 66	.0355	—
Excello	.0355	—
Furnex	.03½	.06
Furnex Beads	.03½	.06
Gastex	.03½	.06
Kosmobile	.0355	—
Kosmobile 66	.0355	—
Kosmos-Dixie 20	.03½	.06
Micronex (Amarillo)	.0355	—
Micronex Beads (Amarillo)	.0355	—
Pelletex	.03½	.06
P-33	.04	.06½
Philblack A	.05	—
Shell Carbon (Del. Midwest)	.0240	—
Sterling	.035	—
Supreme	.0355	—
Thermax	.0225	.05
Wyex	.0355	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00	24.50
99½%-300	ton	—	16.50
86-90%-300	ton	—	13.50
Asbestine	ton	16.50	20.00
Atomite	ton	—	27.50
Barium carbonate (98-100%)	ton	47.00	49.00
Barytes	ton	25.35	36.00
Bentonite	ton	11.00	16.00
Blanc fixe, dry	ton	60.00	67.50
Calcene	ton	37.50	43.00
Catalpo (fact)	lb.	.02	—
Clay, Aerfloted, Suprex	ton	11.00	23.50
Aerfloted Paragon	ton	10.00	22.50
Champion	ton	—	11.00
Crown	ton	—	11.00
Dixie	ton	11.00	23.50
Kaolloid	ton	—	9.00
Langford	ton	—	8.50
Magnolia	ton	—	10.00
McNamee	ton	10.00	22.50
Par	ton	—	11.00
Witco	ton	10.00	—
Kalite No. 1	ton	26.00	52.00
Kalvan	ton	100.00	126.00
Keystone white	ton	—	14.00
Magnesium carbonate	lb.	.06¼	—
Mineralite	ton	—	30.00
Pyrax A	ton	—	7.90
Rottenstone (powd. Dom.)	ton	25.50	37.50
Rubberol	lb.	—	.17½
Silene EF (calcium silicate)	lb.	.055	.06
Silical	ton	65.00	85.00
Snowflake white	ton	—	16.00
Talc, domestic	ton	17.00	25.00
Whiting, commercial	ton	16.00	26.00
Witco	ton	—	6.50
Witcarb R	ton	—	100.00
Witcarb R-12	ton	—	40.00
Wood Flour (100 mesh)	ton	30.00	32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	27.00
Black Diamond	ton	25.00	—
Dielex	lb.	—	.06
Hard Hydrocarbon	ton	25.00	27.00
MilliMar	lb.	—	.05½

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00	4.50
Rodo #10	lb.	5.00	5.50
Curodex 19	lb.	2.75	—
Curodex 188	lb.	3.50	—
Curodex 198	lb.	4.50	—
Para-Dora	lb.	4.50	—
Areaklene No. 375	lb.	.35	.50
Darvan (dispersing agent)	lb.	.30	.39
Santomerse S	lb.	.11	.25
Sponge Paste	lb.	—	.18
Sunproof	lb.	.22¼	.27¼
Tonox	lb.	.50	.59
Ty-Ply	gal.	6.75	8.75
Unicel (blowing agent)	lb.	.50	—

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	3.38	3.63
Nitric, 36 degrees	cwt.	5.00	—
Acids, Fatty			
Laurex	lb.	.14¾	.17¼
SL-20	lb.	.11	.13
Stearex Beads	lb.	.10	.11
Stearite	lb.	.10	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70	5.70
Soda Ash, 58%	cwt.	1.15	2.95
Oils			
Degras, bbls.	lb.	.10	.12
Para-Flux	gal.	.17	.18
Para-Lube	lb.	.046	.048
Petrolatum, amber [b]	lb.	.03½	—
Pigmentaroil, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Pine, tanks	gal.	.55	—
Rosin Oil, cmpd.	gal.	.40	—
Rubberol	lb.	.13½	.14
Rubtack	lb.	.10	—
Seedine, c.l.	lb.	.07¼	—
Witco Palm Oil	lb.	—	—
Witco Softener No. 20	gal.	.20	—
Woburn No. 8, c.l.	lb.	.06	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06	—
coal tar	ton	19.00	22.00
hardwood	ton	16.00	22.50
pine, 200 lb. gr. wt.	bbl.	—	4.50
Pigmentar, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Retort Pine Tar, drums	gal.	.26½	.27½
Solvents			
Acetone, pure [a]	lb.	.07	—
Benzene, 90%, tank car	gal.	.14	—
Beta-Trichlorethane	gal.	—	.20
Bondogen	lb.	.98	1.25
Carbon, bisulfide	lb.	.05	.08½
Carbon tetrachloride	gal.	.83	1.27
Dichlorethylene	lb.	—	—
Dipentene, cml., drums	gal.	.48	.50
Ethylene dichloride	lb.	.07½	.08½
Plastogen	lb.	.07¾	.12
Reogen (drums)	lb.	.11½	.15
Rub-Sol	gal.	.09½	—
Trichlorethylene	lb.	.08	.09½
Turpentine, spirits	lb.	.78½	—
dest. dist., drums	gal.	.50	.55
Waxes			
Antisol	lb.	.22½	.23½
Beeswax, white [b]	lb.	.58	—
Carnauba, yellow [b]	lb.	.83¼	—
Ceresin, white, dom.	lb.	.13½	.15
Montan, crude	lb.	—	—
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04½	—
Refined, 123/125	lb.	.05¾	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95	2.05
Gel	lb.	.52	.54
Hipar	lb.	.61	.63
Powder	lb.	.40	.42
Resin	lb.	.43	.45
Resin D	lb.	.40	.42
White	lb.	1.23	1.33
Albasan	lb.	.69	.74
Antox	lb.	.54	.56
B-L-E	lb.	.40	.49
Flectol H	lb.	.40	.47
Neozone A, C, D, E	lb.	.40	.63
Oxynone	lb.	.77	.90
Retardex	lb.	.44½	.47½
Santoflex B	lb.	.40	.47
Santoflex BX	lb.	.54	.61
Santovar O	lb.	1.15	1.40
S.C.R.	lb.	.32	.34
Stabilite	lb.	.48	.50
Stabilite Alba	lb.	.69	.74
VGB	lb.	.43	.52

EXTENDERS

Naftolen R-100	lb.	.10	.12

LUBRICANTS—MOLD & RUBBER SURFACE

Areaklene	lb.	.35	.50
Cocoa Soapstock	lb.	.06	.08
Colite	gal.	.90	1.15
Dipex	lb.	.06	.08
Glycerized Liquid Lubricant	gal.	—	1.35
Lubrex	lb.	.25	.30
Mineralite	ton	—	30.00
Sericite	ton	65.00	75.00
Soap Tree Bark, cut, sifted	lb.	.06	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25	—
Amberex Type B	lb.	.18¾	—
Black	lb.	.08½	.13
White	lb.	.09	.15
Brown	lb.	.10	.14
Neophax A	lb.	.16½	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 3	lb.	.08	.12
Sulfur Chloride, yellow (drs.)	lb.	.03	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55	—
Commercial (bags)	cwt.	2.20	—
Tellor	lb.	1.75	—
Vandex	lb.	1.75	—
Vultac No. 1	lb.	.38	.45
Vultac No. 2	lb.	.38	.45
Vultac No. 3	lb.	.42	.49

[a] Price Ceilings.
[b] Price Suggestions or Agreements

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Chemicals and Compounding Materials

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; DPG; Pip Pip; A-10; A-32; A-100; R-2 Crystals • ANTIOXIDANTS—Flectol H; Santoflex B, BX; Santovar O.
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron 8, Ohio

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York 20, N. Y.

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 42 years.*
The Aluminum Flake Co.
Akron, Ohio

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CALCENE—SILENE EF
Two exclusive Columbia pigments proving exceptionally valuable to Rubber Compounders. Send for free data sheets.
PITTSBURGH PLATE GLASS CO.
COLUMBIA CHEMICAL DIV.
Grant Bldg., Pittsburgh (19), Pa.

CARBON BLACK-MICRONEX
The world's standard gas black; universally known as the "King of Rubber Pigments."
BINNEY & SMITH CO.
41 East 42nd St. New York 17, N.Y.

CARBON BLACK—Aerfloted
WYEX — TX — HX
Compressed — Compact (Dustless)
J. M. Huber, Inc.
460 West 34th St., New York 1, N. Y.

CARBON BLACK
"Atlantic" Carbon Blacks meet the exacting standards of modern rubber production.
Chas. Eneu Johnson & Co., Mfrs.
Distributed by
C. P. HALL CO.
Akron — Boston — Los Angeles — Chicago

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

CARBON BLACK
CONTINEX SRF—A New Semi-Reinforcing Furnace Black. *Now in Full Scale Production.*
Continental Carbon Co., *Mnfr.*
Witco Chemical Co., *Distributor*
295 Madison Avenue
New York 17, N. Y.

CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.
Moore & Munger
33 Rector Street New York 6, N. Y.

CHEMICALS
Carbon Black—Clay—Colors
Accelerators—Sulphur
Stocks Carried At All Times
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

CHEMICALS
From Coal Tar Bases—For Use As Antiseptics, Plasticizers, Reclaiming Oils, Softeners, Solvents, Tacifiers.
Koppers Company
Tar and Chemical Div.
Koppers Bldg. Pittsburgh, Pa.

CHEMICALS

For Rubber		For Industry Generally
Accelerators	*Acids*	*Latex*
Antioxidants	*Oil of Myrbane*	*Lotol*
Specialties	*Aniline Oil*	*Dispersions*

NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 SIXTH AVE. NEW YORK 20, N. Y.

CHEMICALS
For Natural & Synthetic Rubber
"PICCO" Brand—Plasticizers; Coumarone Resins; Reclaiming Oils, Coal Tar Naphthas.
Pennsylvania Industrial Chem. Corp.
Clairton Penna.

CHEMICALS
A complete line of plasticizers, resins, substitutes, fillers, etc., for Synthetic, Natural and Reclaimed Rubber.
STANDARD CHEMICAL COMPANY
Akron 8, Ohio

CHEMICALS AND MINERAL
Ingredients—Whiting, Clay, Talc, Barytes, Colors. Heavy Calcined Magnesia. Carbonate of Magnesia, Pumice Stone.
Standard Since 1890
Whittaker, Clark & Daniels, Inc.
260 West Broadway New York 13, N. Y.

CHEMICALS
PIGMENTS
ASPHALTUMS
Witco Chemical Company
295 Madison Avenue
New York 17, N. Y.

CLAY
*CHAMPION
*MAGNOLIA
National Kaolin Company
Distributed by
C. P. HALL CO.
Akron — Los Angeles — Chicago

COAL TAR CHEMICALS

Coumarone Resins	Tack Producers
Resinous Oils	Dispersing Oils
Reclaiming Oils	Softeners
	Solvents

The Neville Company
Neville Island, Pittsburgh, Penna.

COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Chemicals and Compounding Materials (continued)

COMPOUNDING Materials

Vulcanizing Agents
Accelerators
Antioxidants
Plasticizers
Dispersions
Pigments
Clays
Mineral Rubber
Aromatics
Blacks

R. T. VANDERBILT CO.
230 Park Ave. New York 17, N. Y.

IRON OXIDES

Absentine—Barytes—Talc—Soapstone

C. K. Williams & Co.
EASTON, PA.

OROPLAST

Plasticizer—Sulphur Reactive
High Loading Tolerated
Great Elongation Produced
Cool Processing Stocks

Advance Solvents & Chem. Corp.
245 Fifth Ave., New York 16, N. Y.

CUMAR —Paracoumarone Resin.

A neutral gum for synthetic rubber compounding. *Laboratory test data, samples and prices on request.*

THE BARRETT DIVISION
Allied Chemical & Dye Corp.
40 Rector St., New York 6, N. Y.

MAGNESIA

Calcined Magnesia—for neoprene
Carbonate of Magnesia—precipitated

The Philip Carey Mfg. Co.
Cincinnati Ohio

PARA-FLUX

The Universal Softener—Adaptable, Uniform. Improves Quality—Economical.

The C. P. Hall Co.
2510 First Central Tower
Akron Ohio

DU PONT Rubber Chemicals

DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS

E. I. du Pont de Nemours & Co., Inc.
RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

MAGNESIUM OXIDE

Calcined Magnesium Oxide prepared for use in the compounding of neoprene. Full details on request.

J. T. Baker Chemical Co.
Phillipsburg New Jersey

PELLETEX (The pellet *Gastex*)

The special process reinforcing black in free-flowing form. Saves power; none wasted; protects adjacent colored stocks.

Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
GENERAL ATLAS CARBON
Pampa, Texas

DUTREX

SHELL DUTREX 6—Plasticizer and Extender for GR-S

Chemically and Physically Controlled

Shell Oil Company, Inc.
50 West 50th St., New York 20, N. Y.

MAGNESIUM OXIDE

Extra Light—Original neoprene type
Also Light, Medium and Heavy types

General Magnesite & Magnesia Co.,
2960 East Venango St., Phila. 34, Pa.

PHILBLACK A

NEW HMF TYPE BLACK
Offers: Excellent Processing — Low Hysteresis, and High Abrasion.

Phillips Petroleum Company
Philblack Division
First Central Tower, Akron

"FACTICE"—Prevents blooming, makes colors fast and a smoother batch.
(Reg. U. S. Pat. Off.)

Stamford Rubber Supply Co.
Stamford, Conn.

MICA

"CONCORD" Wet Ground Mica
It is White, Pure and Uniform
Send for Samples and Prices

CONCORD MICA CORP.
Penacook Station Concord, N. H.

RUBBER PROCESSING OILS

For outstanding compatibility in processing natural or modern synthetic rubbers, use

SUN RUBBER PROCESSING OILS
Write
SUN OIL COMPANY
Philadelphia Pennsylvania

FURNEX—FURNEX BEADS

The High Resilience Semi-Reinforcing Black

BINNEY & SMITH CO.
41 East 42nd St. New York 17, N. Y.

MICA

Waterground White and Biotite
—Used for over 35 years.

THE ENGLISH MICA CO.
220 E. 42nd St., New York 17, N. Y.

RUBBER SUBSTITUTES

White, brown and black.

The Carter Bell Mfg. Co.
Springfield, New Jersey

GASTEX

Special Process Reinforcing BLACK. Superior aging and oil resistant properties. Low permanent set.

Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
General Atlas Carbon
Pampa, Texas

MOLD LUBRICANT

"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.

PROCTER & GAMBLE
Cincinnati Ohio

SOFTENERS

Rosin Oil — Pine Tar
Burgundy Pitch
"Galex" — a non-oxidizing Resin

National Rosin Oil & Size Co.
RKO Bldg., New York 20, N. Y.

The Market Place

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Chemicals and Compounding Materials {continued}

SOLVENTS

"Skellysolve"—A superior solvent in six different types for various uses—for making rubber cements—for many different rubber fabricating operations.

SKELLY OIL CO., SOLVENTS DIV.
Skelly Bldg., Kansas City, Mo.

TITANIUM PIGMENTS
TITANOX

Unsurpassed in
OPACITY, WHITENESS, BRIGHTNESS
Titanium Pigment Corp., Sole Sales Agent, 111 Broadway, New York, N.Y.
104 South Michigan Ave., Chicago
350 Townsend Street, San Francisco
2472 Enterprise Street, Los Angeles

ZINC OXIDE PIGMENTS

The XX Reds Kadox

ZINC SULPHIDE PIGMENTS

The Cryptones The Albaliths (Lithopones)

The New Jersey Zinc Sales Co.
New York *Chicago*
Cleveland, Boston, San Francisco

STEARIC ACID

STEAREX . . . CAKE or POWDER
STEAREX BEADS
Standardized Products for Rubber Compounding
MINERAL RUBBER (Parmr), TALC
SOAPSTONE

BINNEY & SMITH CO.
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NAFTOLEN • MULTIPLAST • ECONO-PLAST
WILMEX • NAFTEX • NAFTOLEN EMULSION
Unique - Efficient - Dependable

Wilmington Chemical Corp.
10 E. 40th St., New York 16, N. Y.

ZINC OXIDES

Black Label Red Label Green Label
Manufactured by Our New Electrothermic Process

St. Joseph Lead Co.
250 Park Ave. New York 17, N. Y.
Plant and Laboratory: Monaca (Josephtown), Pa.

SULPHURS

Rubbermakers' TIRE BRAND and TUBE BRAND. Also CRYSTEX Insoluble Sulphur, Sulphur Chloride, Caustic Soda, Carbon Bi-Sulphide, Carbon Tetra-Chloride.

Stauffer Chemical Company
2710 Graybar Bldg., New York 17, N. Y.

ZINC OXIDES

AZO ZZZ Zinc Oxides
lead free—pure—uniform—dependable
AZO ZZZ-11 AZO ZZZ-55
AZO ZZZ-22 AZO ZZZ-44 AZO ZZZ-66

American Zinc Sales Company
Columbus, Ohio *New York*
Chicago *St. Louis*

ZINC STEARATE
ZINC LAURATE

Colite Mold Lubricant for Extra High Gloss

THE BEACON COMPANY
87 Bickford St., Boston, Mass.

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BANBURYS REPAIRED

Re-building and re-surfacing rotors and mixing chambers has been our specialty for years.

INTERSTATE WELDING SERVICE
914 Miami St. Akron, Ohio

CUTTING MACHINERY

Specialists in Rubber Cutting Equipment for Bands, Crude Stock, Jar Rings, Tubes, Rollers, Washers, Treads, Cement Stock, etc.
See Black Rock for All Cutting Problems

Black Rock Manufacturing Co.
179 Osborne St. Bridgeport, Conn.

LABORATORY Equipment

Builders of Scientific Apparatus and Production Control Laboratory Equipment for almost a Quarter of a Century.
Send for Rubber Catalog K

Precision Scientific Company
1736 N. Springfield Ave. Chicago 47, Ill.

CALENDER SHELLS

Gammeter's
ALL STEEL Calender Shells.
All welded. Any size.
New and better.

The W. F. GAMMETER CO.
Cadiz Ohio

DIAL GAUGES—Thickness

For measuring the thickness of rubber and similar materials. Many models.

Frank E. Randall
248 Ash St.,
Waltham Mass.

MACHINERY—RUBBER

"Master" Tube Molds, Tire Vulcanizers, Molds and Cores, Tire Drums, Tubers, etc.
Special Machinery Built to Order

Akron Standard Mold Co.
Akron, Ohio

CUTTING DIES

Cutting and perforating dies of all types for rubber manufacturers.
Send for our quotations

Brockton Cutting Die & Machine Co.
Avon, Mass.

EXTRUDERS

The pioneer line of tubers, strainers and wire insulating machines. For latest developments inquire of

JOHN ROYLE & SONS
Paterson 3 New Jersey

MACHINERY

L. ALBERT & SON

Trenton, N. J. Stoughton, Mass.
Los Angeles, Calif. Akron, O.

CUTTING DIES

Also Tools, Dies, Jigs, Fixtures, Machine Parts and Special Machinery. Now engaged in Prime and Subcontract Work, Defense and Civilian.

Independent Die & Supply Co.,
LaSalle & Ohio Sts. St. Louis 4, Mo.

GRINDING MILLS

SPAN grinding mill reduces soft and hard rubber to fine powder.
Made in U. S. A.

M. Pancorbo
155 John St. New York 7, N. Y.

MACHINERY

A complete service from the design of machinery to finished products of all kinds. Equipment for Plantations — also Reclaim, Latex and Rubber Plants.
Layouts — Formulas — Processes

Continental Machinery Company
261 BROADWAY, NEW YORK 7, N. Y.

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Machinery and Equipment {continued}

MACHINERY
A Comprehensive Line of Rubber and Plastic Equipment Including: Mills, Hydraulic Presses, Tubers, Extruders, Strainers, Washers, Crackers, Calenders and Refiners.
Erie Engine & Mfg. Co.
953 East 12th St. Erie, Pa.

SPECIAL MACHINERY
For Quality and Efficiency in Working Rubber. Consult us about your problems.
Utility Manufacturing Co.
Cudahy, Wisconsin

TESTING MACHINES
RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
Write for Descriptive Literature
Scott Testers, Inc.
P. O. Box 963 Providence, R. I.

MAGNETIC EQUIPMENT | **of All Kinds**
Separators Drums
Clutches Brakes
Rolls Special Magnets
Stearns Magnetic Mfg. Co.
640 So. 28th St., Milwaukee, Wis.

STOCK SHELLS
A Type for Every Need—Large Diameter—Light Weight — Extra Strong — Seamless.
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

USED MACHINERY
For Rubber & Allied Industries
Mills, Calenders, Hydraulic Presses, Tubers, Vulcanizers, Mixers, etc.
Eric Bonwitt
87 So. High St., Akron, Ohio

MANDRELS—All Types
Circular and Straight—Aluminum and Steel Licensed Under Clyde E. Lowe Co. Patents
Sherardizing and Chrome Plating
Machinery—Air Bag & Mandrel Polishing
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

Rubber—Crude; Scrap; Latex; Dispersions

CRUDE RUBBER
BALATA—SYNTHETIC CHICLE
We handle Manufacturers' Crude Rubber and Balata Purchase Permits.
Charles F. Connor & Co., Inc.
110 State St. Boston, Mass.
Telephone: LAFayette 1202

LATEX
Natural or Synthetic
Normal or Concentrated
Compounded, Uncompounded
Prevulcanized
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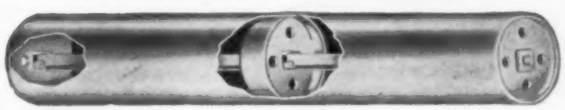

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Schulman facilities are set up to save you time in handling Scrap Rubber. Scientific methods of sorting and baling Scrap by separate grades give you "prescription accuracy" in the quality and quantity you need. Speed your processing . . . . set your Scrap Rubber standards high . . . the Schulman "arrow S" means sure satisfaction.

A. Schulman Inc.
Scrap Rubber

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Announcing a change in name (and in name only)

SCOTT TESTERS, INC.

formerly Henry L. Scott Co.

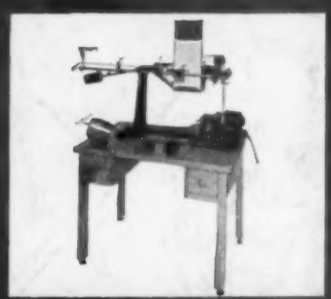
This new name is adopted as more descriptive of the nature of our business, which since 1899 has been the manufacture of physical testing apparatus that has become literally "Standard of the World."

SCOTT TESTERS, INC., PROVIDENCE, R. I.

The 60 models of *Scott Testers comprise machines for a wide range of rubber testing, from 1 gram to 1 ton, including tensile, hysteresis, twist, burst, flexing, adhesion, plasticity, state of cure, etc. Readings are produced in the form of graphic charts, easy to interpret and convenient to file for production records. Circulars upon request.

SCOTT TESTERS

** Registered Trademark*



Scott Testers — Standard of the World